IRON TRADE REVIEW
Registration Applied For
The Authority of Industry — National and International
Vol. LXXII — Cleveland, February 8, 1923 — No. 6

Tonnage Falls Short of Demand

Consumers Experience More Difficulty in Getting Material for Programs Planned—Automobile Industry Operating at Peak—Other Requirements Heavy—Pig Iron Production Keeps Up Gain—Steel Prices Advance More Sharply

GENERAL requirements for steel from all major sources continue to exceed the ability of the works to produce under prevailing conditions and a tenser situation is developing. Much tonnage desired within the next several months is being declined by the mills by force of their present obligations and outlook. Prices clearly have been subordinated by many buyers to assured delivery of material and the advance is more pronounced. Even in agricultural implements which until recently have been a sluggish industry, some manufacturers are prophesying a shortage before the present year ends. All prospects point to a growing stringency of steel supplies as the spring approaches.

More capacity has been put out of commission this week by the lack of crude steel. In the valley district 23 sheet mills were unable to be started or continued in operation for this cause and two finishing mills also were taken off.

The advancing market in finished steel continues. The National Tube Co. and leading independents have raised steel pipe $4 to $6 per ton. Another independent is naming $2 beyond that on black pipe. Seamless boiler tubes are up $6. More independent makers this week advanced sheets $2 to $3 above the Steel corporation price. Strip steel is on the verge of an upward change. The Midvale Steel & Ordnance Co. has advanced plates, shapes and bars to 2.25c, Pittsburgh, or eastern mill.

The advance of the past eight weeks in IRON TRADE REVIEW composite of fourteen iron and steel products remains unbroken. This week the index is $41.83 against $41.61 last week and $41.17 in January.

Iron Output Gains

Pig iron production for the first time in 27 months passed the 100,000-ton daily mark in January. The daily average then was 104,066 tons as against 99,468 tons in December and 106,075 tons in October 1920, the last previous higher figure. Total production in January was 3,226,065 tons, a gain of 142,545 tons over December. Active furnaces at the end of the month showed a net gain of eight stacks over December, placing the total at 261. Record breaking performances in iron and steel output in January were numerous.

Auto Plants at Peak

Vitality of the automobile industry continues to surprise even those closely identified with it and the problem of obtaining sufficient steel to carry out expected programs is becoming more and more pressing. The Ford interests are having difficulty in lining up the tonnage of sheets desired. In the Detroit district at present automobile production is running from 10,000 to 11,000 daily including 5800 Ford, 1400 Chevrolet, 750 Maxwell, 700 Dodge, 690 Buick, 600 Durant cars and the remainder scattering. The Ford Motor Co. has announced a program for 1923 of 6000 cars daily or 1,800,000 total.

Freight car awards in January were 13,390 which maintains fairly well the rate of recent buying. This week a lull has developed in the car market, being occasioned by the prolonged deliveries of steel. Locomotive awards in January totaled 586.

Demands for building steel are keeping active with some producers reporting the heaviest tonnage in their history. Lettings this week were 31,773 tons, the principal contract being 6500 tons for the Cadillac hotel, Detroit. Oil tank awards have contributed 15,000 to 20,000 tons of new business this week.

The pig iron market has quieted down though scattered buying for second quarter is continuing. Neither producers or consumers are disposed to push forward business especially with a softer coke market. Valley basic shows an erratic price condition with small sales this week at $25.50.

French Lose Capacity

France so far has suffered more than Germany in the dislocation of its iron and steel industry, as the result of the occupation of the Ruhr. To date, 12 French blast furnaces have been blown out and seven banked because fuel supplies have failed according to cable advices to IRON TRADE REVIEW. Only six German furnaces have suspended. Furnace coke in France has jumped to 150 francs ($9.19). Coal production in the Ruhr district now is 180,000 tons daily compared with 300,000 tons before the occupation.

Business Trend and Chart Section Page 431

IRON TRADE REVIEW

Registration Applied for

The Authority of Industry National and International

Published Every Thursday by

THE PENTON PUBLISHING CO., CLEVELAND, O.

Member, Audit Bureau of Circulations, Associated Business Papers, Inc., and National Publishers Association

BRANCH OFFICES

BOSTON - - - - - - - - - 426 Old South Bldg.
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FOREIGN OFFICES

BIRMINGHAM, ENG. - - - - - - Prince's Chambers
LONDON, ENG. - 2-3 Caxton House, Westminster, S. W. 1.
PARIS, FRANCE - - - - - - - - 224 Rue de Rivoli

Cable Address, IROTRAPEN, London

Subscription, United States, Cuba and Mexico, $6 per year. Canada, $8.50 per year. Great Britain and other countries, £2:0:0 per year.

Entered at the Postoffice at Cleveland as Second Class Matter

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Unfair Propaganda Promoted

AT ARLINGTON, Va., just across the Potomac from Washington, the federal government has set up a radio broadcasting station. Arlington time, crop reports, explanations of the functions of the federal departments and some of their activities have been projected into space nightly, available to those equipped to listen-in. No department has availed itself of this opportunity to get its message across more than the department of labor.

From the start the department has been in the twilight zone. No lover of humanity attempts to justify child labor, yet some of the radio releases on the subject of child labor have been questionable. The sequel to an air discussion of naturalization is dissection of the 3 per cent immigration act and the entire immigration subject, and it would not be difficult to sustain the charge that the department has been blanketing the eastern United States with anti-immigration propaganda.

A few nights ago the department released a radio on coal. The release told of the vital necessity of an adequate fuel supply in winter especially for the children—which must have engendered warm thoughts in those muddling along on half-ton lots this winter. Then it proceeded to attack the coal industry in general. It portrayed abominable conditions in mining camps, charged a lack of proper school facilities for miners' children and let loose some hundreds of words damaging to the coal industry.

The bituminous coal industry has appointed a special committee to protest to Secretary of Labor Davis, and rightly so. The federal government should be the last agency to pervert the air with propaganda. The advantage it takes of industry is overwhelming and unfair; by radio the department can reach thousands, whole members of families, in a receptive mood. Even more reprehensible is the fact that small boys numerically comprise the largest unit of radio enthusiasts, and the propaganda finds fertile soil in which to take root. Control of the department of labor today as in the Wilson administration appears to be in the hands of organized labor, and if it persists in radioing anti-industry propaganda it will compel industry to wage a battle that will be defensive only at the outset.

Ruhr Situation Affects Exports

LESS iron and steel was sent to foreign countries by American producers in 1922 than any time in 9 years. The total was 1,975,006 tons and the next lowest figure that can be compared is 1,549,554 tons in 1914. When it is considered what a poor year in the steel business 1914 was both before and after the breaking out of the war, the force of the comparison is more apparent. Prior to that time the next lower total was in 1910.

In 1922, exports of iron and steel accounted for about 8 per cent of total production of finished steel. In 1921, they were 15 per cent, in 1920, 15.3 per cent, and in 1914 they were 8.4 per cent. In the prewar years of 1912 and 1913 they were approximately 11 and 12 per cent respectively. This further puts the 1922 showing at a disadvantage.

An examination of the trend of foreign trade in steel, shows that the first half of 1921 was helped materially in tonnage by a carryover of the great activity of 1920. As against the low point in the third quarter of 1921, the outborne shipments have been maintaining a fair degree of increase but this has fluctuated rather widely. A clear parallel, doubtless can be read into these figures with the ebb and flow of commercial conditions and prospects of stability in the disturbed world at large.

The outlook for foreign trade in steel at the beginning of 1923 is no more reassuring than a year ago. At present the Ruhr situation which promises to have an important influence on Germany's ability to export is the paramount consideration. Already American producers are noting the evidence of prospective business being diverted from Germany. This advantage may be short or extended as France is able to develop its policy in the Ruhr and Europe to keep its com-

posure under present trying conditions with the consequent effects upon other countries.

The British iron and steel industry especially, has learned from bitter experience that temporary advantages gained from the political misfortunes of others have been paid for with interest.

Base Prices Are Misleading

WHENEVER differentials are fixed and understood by both parties a base price is, of course, equivalent to a series of prices covering all grades. The difficulty is, however, that with many commodities the base price is neither fixed nor understood.

Southern furnaces usually adhere fairly consistently to established pig iron differentials but even so these are apt to change under varying market conditions. At present southern furnaces are asking a 50-cent premium for each 50 points of silicon above the base grade, whereas within a year differentials of $1 were generally established in that producing district. In the northern and eastern districts differentials are often lowered, advanced, or waived by individual furnaces regardless of general custom. Most assuredly this a furnace's right, just as the quoting of a base price is a furnace's right. The difficulty comes from the fact that consumers have fallen into the habit of considering differentials as a fixed quantity.

Recently a dispute in eastern territory came very near entering court on this very point. A customer placed an order for high silicon iron without specific contract with a northern furnace which had a published base price of $28. The invoice covering this iron showed a $1 premium for each 50 silicon points above the base grade. The customer, who had been in the habit of buying southern iron where 50 cents was the prevailing differential, felt he was not being treated fairly.

The term 'base grade' itself is somewhat misleading. While generally understood to mean silicon 1.75 to 2.25, some eastern consumers, who never use iron below silicon 2.25 to 2.75, consider this latter analysis to be the base. Unfortunately there is no generally uniform nomenclature or symbols covering exactly the different silicon grades of foundry pig iron, and in order for buyers and sellers to be definite and positive, the only sure way remains to specify the percentage of silicon in their inquiries, offers or contracts.

Writing a Needed Specification

LAST year approximately 3,000,000 gross tons, representing 13.5 per cent of the finished steel output of the United States, was used in the construction of buildings and bridges. Under normal conditions, the requirements for building work undoubtedly would be between 4,500,000 and 5,000,000 tons annually.

Considering the importance of structural steel, as evidenced by these figures, it is surprising that comparatively little effort has been made to work out stresses of the materials, and to incorporate them in suitable specifications. It is true that standards have been adopted, column formulas worked out, and hand books containing this information published frequently and distributed widely, but most of these data are hopelessly out of date. In some cases, the tables compiled before the basic open-hearth product had supplanted bessemer steel for general purposes, still are being used by engineers. Moreover, not a few building codes formulated in the days of bessemer steel, continue in force in spite of the fact that the quality and uniformity of structural steel have been vastly improved in the meantime.

The need for new specifications is further accentuated by the growing tendency to use alloy steel in structures. As shown by Dr. George K. Burgess in an article beginning in this issue, "we are living in an epoch intermediate between the low carbon steel and alloy steel periods."

Fortunately, under the driving force of a new organization, the work of drafting a new specification already is under way. Five engineers—probably the five most capable in their line—have drawn up a tentative outline covering the design, manufacture and erection of structural steel for buildings. These men now are making separate studies of the specification to assure its acceptance by the interests concerned.

The iron and steel industry will be indebted to the American Institute of Steel Construction, not only for its enterprise in stirring up interest in an important subject, but also for its success in enlisting the services of eminent authorities to formulate the needed specification.

Tested Reliability

of IRON TRADE REVIEW Reports Over Period of Years Established by Readers

WE have been taking IRON TRADE REVIEW constantly for about eight years. We believe this to be one of the safest and most reliable trade journals that ever came into our office. In reading trade journals we pay strict attention to what we read and then watch the outcome of the judgment of the writers and we believe this trade journal has aided us materially in running our business on sound basis, and we want IRON TRADE REVIEW the balance of the time. *E. G. Moffitt, secretary, The Moffitt Iron Works, Sanford, N. C.*

I was particularly interested in the charts given in your annual number, but I never fail to see the "yellow section" every week for I have found it of considerable value. *W. H. Clarke, engineer, Hyatt Roller Bearing Co., Cleveland.*

We have been much interested in following from week to week the business trend as presented in the chart section of your publication. Information thus obtained has proved helpful. *Stephen P. Foster, statistician, Norton Co., Worcester, Mass.*

Composite Market Average

Representing the Combined Average Prices per Ton of Fourteen Leading Iron and Steel Products, Yesterday, One Week, One Month, Three Months, One Year and Nine Years Ago

February 7, 1923	January 31, 1923	January, 1923	November, 1922	February, 1922	February, 1914
$41.83	$41.61	$41.17	$42.08	$32.86	$23.52

Products Included Are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

SCRAP PRICES, PAGE 406, WAREHOUSE PAGE 399, ORE, NUTS, BOLTS AND RIVETS AND PIPE PRICES, PAGE 402

Iron and Steel Prices

Pig Iron

Bessemer, valley	$27.75 to 28.00
Bessemer, Pittsburgh	29.52 to 29.77
Basic, valley	25.50 to 27.00
Basic, Pittsburgh	27.27 to 28.77
Basic, Buffalo	28.00
Basic, del., eastern Pa.	28.00 to 29.00
Malleable, valley	27.00 to 28.00
Malleable, Pittsburgh	28.77 to 29.77
Malleable, Chicago	29.50 to 30.00
Malleable, Buffalo furnace	20.50
Malleable, del., eastern Pa.	29.50 to 30.00

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.23
No. 2 Southern foundry	1.75 to 2.25
No. 2X East'n and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 to 3.25
No. 1 Chicago	2.25 to 2.75
No. 2 foundry Eastern	1.75 to 2.25

No. 1X, eastern del., Phila.	31.13 to 32.13
No. 1X, Buffalo	29.00 to 30.00
No. 2 foundry, valley	27.00 to 28.00
No. 2 foundry, Pittsburgh	28.77 to 29.77
No. 2 foundry, Buffalo	28.00
No. 2 foundry, Chicago	29.50 to 30.00
No. 2 foundry, Granite City	30.00 to 31.00
No. 2 foundry, Ironton fur.	28.00
No. 2 foundry, Cleveland del.	29.00
No. 2 foundry, del., Phila.	28.76 to 29.13
No. 2 foundry, N. J. tidewater	29.13 to 29.76
No. 2X, eastern del., Phila.	29.76 to 30.13
No. 2X, east. N. J. tidewater	30.13 to 30.76
No. 2X, eastern del., Boston	31.65 to 33.65
No. 2X foundry, Buffalo fur.	28.50 to 29.00
No. 2X, Buffalo del. Boston	32.91 to 33.91
No. 2 southern, Birminghma.	24.00 to 25.00
No. 2 southern, Cincinnati	28.05 to 29.05
No. 2 southern, Chicago	30.01 to 31.01
No. 2 southern, Philadelphia	31.80 to 32.80
No. 2 southern, Cleveland	30.01 to 31.01
No. 2 southern, Boston (rail)	33.61 to 34.61
No. 2 southern, St. Louis	29.17 to 30.17
No. 2X, Virginia furnace	27.50
No. 2X, Virginia Phila.	32.67
No. 2X, Virginia Jersey City	33.04
No. 2X, Virginia Boston	33.42
Gray forge, eastern Pa.	28.50 to 29.00
Gray forge, val. del.	27.77 to 28.77
Low phos., standard, valley	35.00 to 36.00
Low phos., standard, Phila.	Nominal
Low phos., Lebanon furnace	30.00
†Low phos. British tidewater	29.00 to 30.00
Charcoal, Birmingham	32.50 to 34.00
Charcoal, Superior, Chicago	33.15

Silvery Iron

Jackson County, Ohio, furnace

8 to 9 per cent	$36.50
9 to 10 per cent	38.50
10 to 11 per cent	40.50
11 to 12 per cent	43.50
12 per cent	45.50
13 per cent	48.00

Bessemer Ferrosilicon

Jackson County, Ohio, furnace

10 to 11 per cent	$45.50
11 to 12 per cent	48.80

Ferroalloys

Ferromanganese, 78 to 82 per cent domestic seaboard base	$107.50
Ferromanganese, delivered, Pittsburgh	$112.29
†Ferromanganese, 79 per cent, English, c.i.f. Atlantic port	107.50
Spiegel 19 to 21 per cent furnace	34.00 to 37.00
Ferrosilicon, 50 per cent contract freight allowed	82.50 to 87.50
Ferrotungsten, standard, per pound contained	85.00
†Duty paid.	
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon per pound contained, makers plant	13.00
Imported ferrochrome, 4 to 6 per cent carbon	12.00
Ferrovanadium, 30 to 40 per cent per pound estimated, according ton analysis	$3.50 to $4.00
Ferro carbon-titanium, carloads, producers plant, per net ton	$200.00

Coke

Beehive, Ovens

Connellsville furnace	$7.50 to 8.00
Connellsville foundry	9.00 to 9.50
Pocahontas furnace	nominal
Pocahontas foundry	nominal
New River furnace	9.50 to 10.00
New River foundry	11.50 to 12.50
Wise county furnace	7.50 to 8.50
Wise county foundry	8.50 to 9.50
Alabama furnace	7.00 to 7.50
Alabama foundry	8.00 to 8.50

By-Product

Foundry, Newark, N. J., del.	$12.84 to 12.91
Foundry, Chicago, ovens	15.00
Foundry, Boston, delivered	16.00
Foundry, Granite City, Ill., ovens	14.00
Foundry, Alabama	8.00 to 8.50

Semifinished Material

BILLETS AND BLOOMS

(4 x 4-inch)

Open-hearth, Pittsburgh	$38.50
Open-hearth, Youngstown	38.50
Open hearth, Philadelphia	45.17
Bessemer, Pittsburgh	38.50
Bessemer, Youngstown	38.50
Forging, Pittsburgh	45.00 to 47.50
Forging, Philadelphia	50.17 to 52.67

SHEET BARS

Open-hearth, Pittsburgh	$38.50 to 40.00
Open-hearth, Youngstown	38.50 to 40.00
Bessemer, Pittsburgh	38.50 to 40.00
Bessemer, Youngstown	38.50 to 40.00

SLABS

Pittsburgh	$38.50
Youngstown	38.50

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$47.50 to 50.00
Grooved skelp, Pittsburgh	2.10c to 2.25c
Universal skelp, Pittsburgh	2.10c to 2.25c
Sheared skelp, Pittsburgh	2.10c to 2.25c

Shapes, Plates and Bars

Structural shapes, Pittsburgh	2.10c to 2.75c
Structural shapes, Phila.	2.425c to 2.575c
Structural shapes, New York	2.44c to 2.59c
Structural shapes, Chicago	2.20c
Tank plates, Pittsburgh	2.10c to 2.25c
Tank plates, Philadelphia	2.425c to 2.575c
Tank plates, New York	2.44c to 2.59c
Tank plates, Chicago	2.20c to 2.30c
Bars, soft steel, Pittsburgh	2.10c to 2.25c
Bars, soft steel, Philadelphia	2.325c to 2.575c
Bars, soft steel, New York	2.34c to 2.59c
Bars, rail steel, Chicago	2.00c to 2.10c
Bars, refined iron, Pittsburgh	2.75c
Bars, rail steel, Chicago	2.00c
Reinforcing bars, Pittsburgh	2.10c to 2.25c
Bar iron, common, Phila.	2.425c to 2.575c
Bar iron, common, New York	2.44c to 2.59c
Bar iron, common, Chicago	2.35c

Hoops, Bands, Shafting

Hoops, Pittsburgh, large	2.75c to 2.90c
Hoops, Pittsburgh, small	3.00c to 3.25c
Bands, Pittsburgh	2.75c to 2.90c
Cotton ties, per bundle, Pitts.	$1.17
Cold finished steel bars, Pittsburgh base	2.65c
Steel shafting	2.65c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open hearth rails, mill	43.00
Relaying rails, St. Louis	27.00 to 37.50
Relaying rails, Pittsburgh	28.00 to 32.00
Light rails, 25 to 45, mill	2.15c
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.90c
Spikes, small and boat, Pitts.	3.50c
Spikes, railroad, Chicago	3.00c
Track bolts, Pittsburgh	3.85c to 4.50c
Track bolts, Chicago	4.00c
Tie plates, Pittsburgh	2.45c to 2.65c
Tie plates, Chicago	2.45c

Wire Products

100 lbs. to Jobbers in Carloads

Wire nails, Pittsburgh	2.70c to 2.80c
Plain wire, Pittsburgh	2.55c
Annealed wire, Pittsburgh	2.70c
Galvanized wire, No. 9 gage, Pittsburgh	3.15c
Barbed wire, painted, Pitts.	2.85c to 2.95c
Barbed wire, galv., Pittsburgh	3.35c to 3.45c
Polished staples, Pittsburgh	3.00c to 3.10c
Galvanized staples, Pittsburgh	3.35c to 3.45c
Coated nails, count keg, Pitts.	2.20c to 2.30c
Woven wire fencing (retailers)	68 off
Woven wire fencing (jobbers)	70½ off

Chain, Piling, Strip Steel

Chain, 1-in. proof coil, Pitts.	6.25c
Sheet piling base, Pittsburgh	2.15c to 2.30c
Hot rolled strip steel, Pittsburgh stamping quality	2.75c to 2.90c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier, base	4.50c

Sheets

SHEET MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.50c
No. 28, bessemer, Pittsburgh	3.35c to 3.50c
No. 28, open hearth, Phila.	3.675c to 3.825c
No. 28, open-hearth, Chicago	3.59c to 3.69c

TIN MILL BLACK

No. 28, open-hearth, Pittsburgh	3.35c to 3.50c
No. 28, open-hearth, Chicago.	3.69c

GALVANIZED

No. 28, open-hearth, Pittsburgh	4.35c to 4.50c
No. 28, bessemer, Pittsburgh	4.35c to 4.50c
No. 28, open-hearth, Phila.	4.675c to 4.825c
No. 28, open-hearth, Chicago.	4.64c to 4.69c

BLUE ANNEALED

No. 10, open-hearth, Pittsburgh	2.50c to 2.75c
No. 10, bessemer, Pittsburgh	2.50 to 2.75c
No. 10, open-hearth, Phila.	2.825c to 3.225c
No. 10, open-hearth, Chicago	2.84c to 2.89c

AUTOMOBILE SHEETS

No. 22 Pittsburgh	4.70c to 5.00c

Tin Plate

Per 100 lb. box.

Tin plate, coke base, Pitts.	$4.75

Iron and Steel Pipe

Base Discounts Pittsburgh to Jobbers in Carloads

	Black	Galv.
1 to 3-inch, butt steel	64	52½
1 to 1½-inch, butt iron	30	13

Boiler Tubes

Carload Discount 4 Points Larger

Steel, 3¼ to 13 inches, 1 c.	45 off
Charcoal iron, 3¼ to 4½ inches l. c.	11 off
Seamless hot rolled, 3¼ to 4-in. l. c.	1.42 off

Cast Iron Water Pipe

Class B Pipe

Four-inch, Chicago	57.20 to 57.70
Six-inch and over, Chicago	53.20 to 53.70
Four-inch, Birmingham	49.00 to 49.50
Six-inch and over, Birmingham	45.00 to 45.50
Four-inch, New York	62.30
Six-inch and over, New York	57.30
Three-inch, Birmingham	52.00 to 52.50

Class A pipe is $4 higher than Class B.

Standard fittings, Birmingham, base, $110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Prices Present and Past

Representative market figures yesterday, and for last month, three months ago and one year ago

	Feb. 7 1923	Jan. 1923	Nov. 1922	Feb. 1922
PIG IRON				
Bessemer, valley, del., Pitts.	$29.52	29.27	33.77	21.31
Basic valley	25.50	25.90	29.77	19.81
*No. 2 foundry, del. Pittsburgh	28.77	28.77	30.17	20.96
*No. 2 foundry, Chicago	29.50	28.80	30.60	18.90
Lake Superior charcoal, Chicago	33.15	33.15	36.15	30.50
Malleable valley	27.00	27.75	29.60	19.00
Malleable, Chicago	29.50	28.80	30.60	18.90
*Southern No. 2, Birmingham	24.00	23.30	24.00	15.35
*Southern Ohio, No. 2, Ironton	28.00	27.90	29.75	19.25
Basic eastern del., eastern Pa.	28.00	27.70	28.00	19.84
**No. 2X, Virginia furnace	27.50	27.50	31.40	22.00
**No. 2X, eastern del. Phila.	29.76	29.56	30.50	21.35
Gray forge val. del., Pittsburgh	27.77	27.77	29.77	20.96
Ferromanganese, del., Pittsburgh	112.29	109.79	104.92	65.32
SEMIFINISHED MATERIAL—				
Sheet bars, bessemer, Pittsburgh	38.50	37.50	38.80	29.00
Sheet bars, open-hearth, Pittsburgh	38.50	37.50	38.80	29.00
Billets, bessemer, Pittsburgh	38.50	37.50	38.80	28.00
Billets, open-hearth, Pittsburgh	38.50	37.50	38.80	28.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.10	2.00	2.00	1.40
Steel bars, Chicago	2.10	2.08	2.00	1.52
Steel bars, Philadelphia	2.475	2.385	2.325	1.76

	Feb. 7 1923	Dec. 1922	Oct. 1922	Jan. 1922
FINISHED MATERIAL Continued				
Iron bars, Philadelphia	$2.475	2.365	2.325	1.76
Iron bars, Chicago mills	2.35	2.35	2.50	1.60
Beams, Pittsburgh	2.10	2.05	2.00	1.40
Beams, Philadelphia	2.475	2.385	2.325	1.76
Beams, Chicago	2.20	2.18	2.10	1.52
Tank plates, Pittsburgh	2.10	2.05	2.00	1.40
Tank plates, Philadelphia	2.475	2.385	2.325	1.76
Tank plates, Chicago	2.20	2.18	2.10	1.52
Sheets, blk., No. 28, Pittsburgh	3.35	3.35	3.35	3.00
Sheets, blue anl., No. 10, Pitts.	2.50	2.50	2.60	2.25
Sheets, galv., No. 28, Pittsburgh	4.35	4.35	4.35	4.00
Wire nails, Pittsburgh	2.70	2.70	2.70	2.45
COKE—				
Connellsville furnace, ovens	7.50	8.25	7.10	2.95
Connellsville foundry, ovens	9.00	9.00	8.40	3.80
OLD MATERIAL—				
Heavy melting steel, Pittsburgh	23.50	21.65	20.40	13.95
Heavy melting steel, eastern Pa.	20.50	19.70	16.70	12.25
Heavy melting steel, Chicago	19.00	18.70	17.40	11.15
No. 1 wrought, eastern Pa.	23.00	22.25	21.20	15.20
No. 1 wrought, Chicago	20.00	19.50	18.10	11.65
Rails for rolling, Chicago	21.50	20.50	18.90	11.50

*1.75 to 2.25 silicon **2.25 to 2.75 silicon

Pig Iron Buying Is Quieter

Neither Consumers or Producers Are Pushing Business for Second Quarter—Spot Buying Is Not Heavy—Valley Basic Again Sells at $25.50—Foreign Iron Is Quoted at Higher Level

Philadelphia, Feb. 6.—Pig iron buying in Eastern Pennsylvania district is smaller. Foundry iron continues quoted at $28, base, Eastern Pennsylvania and New Jersey furnaces plus $1 for silicon differentials. New business in the steelmaking iron includes 2000 tons of basic and 1500 to 2000 tons of copper-bearing low phosphorus. English low phosphorus iron is quoted $29.50 to $30.50, duty paid tidewater. Eastern Pennsylvania malleable iron continues at $28.50 furnace, with some small lots having been closed at $29.

Instead of Wabana iron as previously reported, it is the so-called Besco iron of British Empire Steel Corp. that has been sold in this district the past two weeks. The total sold is 12,000 to 15,000. Some of the tonnages went to steel works and some to iron pipe companies. This iron is high in phosphorus and sulphur and had been in stock for two years. The prices were below the domestic basic market but were not as low as reported. However, these stocks now are cleaned out and it is not certain whether any more tonnage is obtainable. If it is obtainable, it will be from current production in which case the iron will be made to analysis and the prices recently done, cannot be duplicated.

Local Situation Offers Contrast

Pittsburgh, Feb. 6.—With pig iron advancing in other districts the local situation offers a contrast, particularly in basic iron as to price and in other grades as to size of orders placed. Sales of basic have been recorded during the past week at $25.50 valley, a reduction of 50 cents per ton from the minimum of one week ago and this matches the figure prevailing earlier in January. One sale of 1500 tons the past week was closed at that figure and others of 1000 tons at a time. Included among those who took basic are the Colonial Steel Co., the West Penn Steel Co. and a blast furnace interest in one of the nearby valley districts. This condition in basic it is thought is temporary and that the next sales will register higher levels since now $26 $26.50 and $27 valley are quoted. Several 1000-ton inquiries are out and one involving 3000 tons for a nearby melter was issued this morning. Bessemer iron has advanced 25 cents, the minimum now being $27.75, valley. Several sales aggregating 1000 tons the largest of which calls for 400 tons carried that level. One valley producer continues to quote $28 valley. Inquiries involve two or three lots of 500 tons each. The McConway & Torley Co. is asking for 500 tons. So far as reported here the Andrews Steel Co., Newport, Ky., has not closed on its 1000-ton inquiry issued last week. Several inquiries are out for full second quarter requirements of malleable. From $27 to $28 is quoted in the spot market, but makers are not inclined to quote as high for second quarter. Foundry iron still is quoted $27 to $28, valley on the No. 2 grade, with sales small. Several hundred tons of gray forge iron was sold to a local melter at a figure reported between $26 and $27, valley. Small lots of low phosphorus copper free iron continue to be moved at $35 to $36, valley. The McKinney Steel Co. is blowing in Josephine, Pa., furnace on bessemer. It will blow

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out one of its Cleveland stacks and coke for Josephine will be shipped from the river.

The January monthly of W. P. Snyder & Co. were $27.50 valley on bessemer and $25.583 on basic compared with $28.098 an d$24.567 in December respectively.

Second Quarter Business Developing

Cleveland, Feb. 6.—A steady flow of orders is developing for second quarter tonnages of pig iron, and the market is stronger for that delivery. A Cleveland maker has advanced its price twice in the week, now quoting $28.50, furnace, for delivery in Cleveland or nearby territory. This represents an increase of $1 in the week. This interest has booked close to 8000 tons of iron in the last few days, some of which takes the higher price, and the bulk of which is for second quarter for Cleveland foundries. Included in the tonnage is a 2000-ton order and one lot of 3000 tons. Some other interests in the northern Ohio group have sizable tonnages for the next quarter, amounting in the aggregate to around 15,000 tons. The spot market is quiet, and the bulk of the tonnage taken is for April, May and June. Business for those months is gaining momentum, but there is not the snap in the market that was noted during the December rush of business, due in part to the fact that some makers are not disposed to hurry matters. A lake furnace interest is quoting $28.50 for the second quarter from two points. It has taken some business at $29, lake furnace, for delivery in May, and has done as high as $29.50 for spot tonnage. In the Detroit district pig iron is quoted at $28 to $29 for the second quarter, while $29 is the nominal figure for prompt lots. A furnace represented in the northern Ohio group has booked 300 tons at $28.50, valley furnace, for second quarter. The ease with which $28.50, furnace, is obtained at present for second quarter iron leads one representative maker to predict a price of $30, within the next few weeks. No further sales of basic are reported. The car situation is causing some difficulty at points west of Cleveland. A Dayton, O., consumer is inquiring for 200 tons of foundry iron.

More Second Quarter Sales

Boston, Feb. 6.—Inquiry and orders for second quarter delivery of pig iron have improved during the past week. First quarter sales, however, have been light. Prices for spot delivery in several cases have advanced, but there is a tendency toward softness in future delivery transactions. One of the leading Buffalo interests holds prices firm at $28 for the base grade, $29 for No. 2X, (2.25 to 2.75 silicon), and $30 for No. 1X, (2.75 to 3.25 silicon). Sales are reported at these prices. At least one Buffalo interest, however, is understood to be offering the base grade at $27 with $1 differential, and this latter schedule is being underbid by at least two eastern Pennsylvania furnaces. One inquiry during the week developed exceptionally low prices from Buffalo, Pennsylvania, New York and Virginia. Both malleable iron and No. 2X iron sold at close to $31, delivered, which is

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in marked contrast to a spot sale of 100 tons, reported at $34.50, delivered. New England foundries in general are well covered by contract for first quarter requirements, and inquiry at present is light. One foundry is asking for 500 to 1000 tons for delivery in the next 60 to 90 days.

Quote $28 for Second Quarter

Buffalo, Feb. 6.—Local furnaces are quoting $28 base on second quarter pig iron business, but are not pushing it strongly. The differentials for silicon on this business is $1. Furnaces are still able to take some first quarter business and are quoting $28 base and in some cases 50-cent differentials. Inquiry reported by one furnace interest for the week is 7000 tons, with 4000 to 5000 tons being closed. The malleable price is $28.50. The Bethlehem Steel Corp. is reported to have lighted two more stacks at Lackawanna, making seven in all.

Second Quarter Iron Placed

Chicago, Feb. 6.—Buying of pig iron for second quarter delivery is increasing. It is entirely voluntary on the part of consumers, as producers are not pushing sales. The total second half iron booked as yet is not equal to half the production of furnaces here. Orders are being booked for first quarter, second quarter and for the period of February to July. On this business the quotation is $29.50, Chicago furnace, although on some spot tonnage $30 has been obtained. In a few instances inquiries for third quarter have been put out, one from a stove manufacturer. This indicates need for iron through the year.

A malleable melter at Chicago has covered 3000 tons of malleable iron and 1000 tons of foundry iron for second quarter. Other sales are of usually smaller tonnages. Inquiry includes 1000 tons each of foundry iron for a Michigan and an Illinois melter and lots of 200 to 500 tons from various sources. Inquiry is being placed promptly.

More activity is appearing in silveries, with prices steady and no large buying. Low phosphorus iron is quiet at $37, Chicago, with little demand. Imported iron is not arriving promptly for those who bought from that source. Little activity is noted in Lake Superior charcoal iron, which is steady at $30, furnace.

Some disturbance is being created by sales of malleable iron under the general level, the source of which has not been traced. Sellers adhering to the regular quotation have consistently lost business to an unknown seller with a lower figure.

Foreign Iron Higher

New York, Feb. 6.—A lull in buying has succeeded the activity which for six weeks characterized the pig iron market here. This appears due to some extent to the railroad embargoes which are holding up shipments to many consuming plants. The demand for iron in some of the embargoed territories is reflected by the fact that importers now are getting at least $1.50 higher for foreign iron in New England than in the New York and Philadelphia districts. In the New England district foundry iron equivalent to standard 1.75 to 2.25 silicon, is bringing $29.75, duty paid tidewater, and the 2.25 to 2.75 silicon grade, $30.25, duty paid. Scotch foundry has sold in New England during the past week as high as $30.75 to $31.75, duty paid. In the New York district, continental foundry equivalent to the 1.75 to 2.25 silicon grade can be had at $28.25, duty paid tidewater, and the 2.25 to 2.75 silicon grade at $28.75, duty paid. These prices apply to foreign iron which the merchants have outstanding on contracts with foreign producers. It would be necessary to pay considerably higher for iron purchased at the prices now ruling abroad.

The eastern Pennsylvania and New Jersey market is strong at $28, base furnace, plus $1 silicon differentials and this price level applies to second quarter as well as first quarter. The Buffalo market is not so strong. Buffalo foundry can be had for first quarter at $28, base furnace, plus 50-cent and $1 silicon differentials. For second quarter, Buffalo foundry shows a wide range, selling at $27 to $28, base furnace, plus 50-cent and $1 silicon differentials. Central Pennsylvania foundry prices reflect considerable variation, ranging from $27.50 to $29, base furnace, plus 50-cent and $1 differentials. On Virginia foundry the market is unchanged at $27 base furnace, plus 50-cent silicon differentials. During the past week considerabe English low phosphorus iron, including one lot of 2000 tons, has been sold at $30.50, duty paid tidewater. Malleable iron now is bringing $28.50 to $29, eastern Pennsylvania furnace.

Southern Prices Firmer

Cincinnati, Feb. 6.—Fair sales of pig iron are reported by southern furnace interests for delivery during the first quarter. Inquiries are numerous for the second quarter. Few southern furnaces are willing to sell at less than $24, Birmingham base. Some iron has been closed at $23.50 base. Round lots of pipe-making iron have been sold on a $25 base. The southern Ohio market has strengthened and there is practically no iron offered here under $28, Ironton base. January business was very satisfactory from the standpoint of the producers. No large individual orders are recorded, but there is an accumulation of small tonnages which represent a fairly large volume. A survey of the local situation indicates there is little prospects of any large buying in the next 30 days. As a rule makers are reluctant to quote on second quarter business. It is reported here that a southern furnace sold 500 tons of iron to a Michigan automobile concern at $23.50, Birmingham base. This is the lowest price recorded on southern iron in this district. A sale of 150 tons of southern iron to an Indiana consumer is noted, while the Globe Stove & Range Co.

of Kokomo, Ind., is reported to have closed for 500 tons of southern iron. The Norfolk & Western railroad is in the market for 1200 tons of iron to meet its specifications.

Good Sales Made at St. Louis

St. Louis, Feb. 5.—The pig iron market is featured by brisk buying and firm prices. Melters of malleable and foundry iron have figured prominently in the buying movement, particularly the stove interests, which normally are the heaviest consumers in this district. Steelmakers are also in the market and several good inquiries for basic are pending. Steel plants are operating as near capacity as labor and materials will permit, and are unable to supply all the demands made upon them.

Most of the Alabama furnaces have moved their price up to $25, four of the leading producers quoting that figure. Some small tonnages are offered under this price, but not enough to affect the market. One stove builder secured a tonnage at $23.50, but this was understood to be iron purchased by a broker considerably lower, and sold by him to avoid demurrage. No. 2 northern holds strong at $29 to $30, and the leading local producer continues to quote $30 to $31, f.o.b. Granite City. Sellers report that all their customers are urging delivery of contract quotas.

Sales reported during the past several days aggregate close to 10,000 tons. The St. Louis Coke & Chemical Co. has sold 1000 tons of foundry iron to a melter in this district for delivery through February and March, 300 tons to a stove builder for prompt shipment, 800 tons to a car wheel maker, and small miscellaneous tonnages totaling several hundred tons. This interest reports an inquiry from an Indiana melter for 2000 tons of malleable, and one from a local melter for 500 to 1000 tons of basic. One agency reports selling 1000 tons, including 500 tons to a southern Illinois melter and 250 tons to a local stovemaker. Two of the leading stove plants have taken 500 tons each, for February and March delivery. A Colorado steelmaker is inquiring for 500 tons of ferromanganese for quick shipment.

Southern Market Strong

Birmingham, Ala., Feb. 5.—The southern pig iron market is strong and sales are made easily at $25 base. Production is being maintained at capacity. The Woodward Iron Co. has blown in the larger of the Vanderbilt furnaces, and blown out the smaller one for repairs, the latter to resume within 20 to 30 days. The Shelby Iron Co. will blow in its charcoal iron furnace at Shelby the latter part of next week. The Tennessee Coal, Iron & Railroad Co. has seven furnaces on basic and four on foundry and is repairing the old Oxmoor furnace, which has not been in blast for four years. Practically every furnace interest in the Birmingham district reports excellent production in January and the melt in the home territory and shipments from here exceed the output. Recent orders from Ohio, Indiana, Illinois and Kentucky indicate an expanding need for pig iron. The Alabama Co. expects to be able to start up its second blast furnace at Gadsden within the next two weeks.

Coke Prices Are Lower

Sales of Furnace Fuel Register Reduction of 25 Cents—Heating Qualities Also Lower—Foundry Grades Still High

COKE PRICES, PAGE 410

Pittsburgh, Feb. 6.—Recent sales of beehive furnace coke have registered a further decrease of 25 cents per ton from the levels established one week ago. Several sales of 50 to 100 carloads each have been made to blast furnace interests at $7.50, $7.75 and $8 as compared with $7.75 and $8.25, the preceeding week's spread. Various furnace operators thus are able to average up on some of the coke bought at $8.25 and $8.50 two or three weeks ago, one large eastern steel company having paid that maximum on a fairly large quantity for blast furnace use. Those entering the market recently for as much as several thousand tons a month have included the Shenango Furnace Co., the Bethlehem Steel Co., the Wheeling Steel & Iron Co., and several other eastern interests. Other pig iron producers now are issuing tentative insuiries for the second quarter. Some are asking for coke for March only but believing that strong declines shortly will be inaugurated have postponed action. Heating coke also has slipped backwards, this fact influencing the furnace grade. The decline in heating coke has accompanied a decreased demand which is traceable to the fact that sizable tonnages are on hand or on the way to eastern, western and Canadian consuming points which will satisfy all needs. Around $7 now is being quoted for heating quality coke. Foundry coke still remains relatively high, $9 to $9.50 being quoted on certain brands of standard selected 72-hour fuel, although middle interests have been able to buy at $8.75, ovens. Certain brands still bring premiums of 25 to 50 cents per ton above the $9.50 level. Production of coke in the Connellsville region for the week ended Jan. 27 was 245,690 tons as compared with 234,680 tons the preceding week, according to the *Connellsville Courier*.

Coke Prices Unchanged

Boston, Feb. 6.—Demand for shipment of foundry coke against contracts continues to be insistent, and while no cases have been reported where plants have had to close through lack of fuel, yet the delays in delivery are a source of considerable anxiety to foundries. Some spot orders are being placed for Connellsville fuel. New England by-product prices continue unchanged. On contracts placed, the Providence Gas Co. is quoting $15, delivered, and the New England Coal & Coke Co. $16, delivered. Connellsville coke is offered for spot delivery at $15 to $15.50, delivered.

Embargoes Affect Prices

New York, Feb. 6.—Softer prices have developed in the coke market due to the extent to which railroad embargoes are preventing shipments. Unembargoed consumers are not providing sufficient outlet for the production and the prices have eased off to around $9.25, Connellsville, on standard foundry coke and $7.50, Connellsville, on furnace coke. The Seaboard By-Products Coke Co. continues to quote $12.84 to $12.91, delivered at Newark and other New Jersey points, for by-product foundry coke.

Car Situation Worst Since 1920

Cincinnati, Feb. 6.—Demand for foundry and furnace coke has eased off, and while prices continue firm, this is due largely to the producers' inability to obtain sufficient cars. The car situation, especially in the Connellsville district, is said to be the worst since 1920, and as a result foundries are finding it difficult to accumulate stocks. Some coke plants, with heavy contracts, are getting but one day's run of cars a week. Little coke is offered here for prompt shipment, and where this condition prevails, prices above the average are obtained. Aggregate sales for the past week fell slightly below the average for the week previous. Judging from production sheets ovens will have large tonnages to offer the latter part of this month, if there is an improvement in the rail situation. While prices have undergone no revision, the spread especially on Wise county coke has been lessened somewhat. The prevailing quotation on the furnace grade ranges from $7.50 to $8.00, while the foundry grade is quoted $8.50 to $9.00. The Indianapolis by-product coke market continues firm, with producers in arrears in deliveries.

Beehive Coke Hard To Obtain

St. Louis, Feb. 5.—Beehive coke continues high, and hard to obtain. Quotations on 72-hour foundry from the Connellsville district range from $9.50 to $10, while 48-hour furnace coke is bringing $7.50 to $8.00. The demand is not heavy, but it is difficult for users to obtain the small tonnages required. The entire situation, so far as eastern and southern coke is concerned, depends on the transportation situation. By-product makers in the district continue to take care of the industries, so there is no shortage. Ovens are being operated at capacity. The call for industrial coke continues undiminished, with demands for water-gas coke particularly strong. Heavy contracting by these interests is reported.

Demand Exceeds Output

Birmingham, Ala., Feb. 5.—Southern coke makers are still taking on business, short orders now being numerous. Prices remain firm, though quick delivery coke commands a premium of $1 per ton. Beehive coke oven operations are being increased. All by-product coke ovens are in full operation. Beehive foundry coke is selling at $7.50 to $8.00, and by-product foundry coke at $7.50 to $8.50. One or two sales were consummated a few days ago at $9 and $10 per ton, the tonnage being small. Several long time contracts were placed in this district recently.

Bar Tonnages Declined

Producers, Unable To Meet Delivery, Turn Away Considerable Business—Buying Exceeds Production—Prices Firming Up

BAR PRICES, PAGE 410

Chicago, Feb. 6.—Soft steel bars continue quoted at 2.10c, Chicago mill, by all producers here, but the leading independent is likely to increase this quotation $2 to $3 per ton to apply on its second quarter tonnage, which will be divided among its customers shortly. It appears Pittsburgh mills now are quoting 2.10c, Pittsburgh, and inasmuch as many users are unable to obtain further supply except from the East the Chicago delivered price is much lower. Buying of soft steel bars continues at a greater rate than mill production and much business is being turned down by producers. The matter of delivery is becoming most important and Chicago mills are unable to meet present requirements of most buyers. While demand is coming strongly from all sources agricultural implement makers are a feature as their requirements are increasing steadily.

Demand for bar iron is good and some makers are turning down business. Mills are operating at single turn because of lack of labor and because double turn usually brings higher costs. Quotations are strong at 2.35c, Chicago mill, and some business has been done at 2.50c, mill.

Rail steel bars have been advanced from 2.00c to 2.10c, mill, by some producers, the higher figure applying on recent bookings. It is believed this figure will apply on most business shortly. Business is being taken about equal to production. Higher cost of rerolling rails has made the higher quotation necessary.

Deliveries Governing Bookings

Pittsburgh, Feb. 6.—Sellers of merchant steel bars are in a position where as much if not more business than they can take has to be refused because desired deliveries cannot be granted. They are obligated for many weeks to come; some into April. On these contracts the ruling figure latterly has been 2.10c but now in the spot market up to 2.25c is being quoted. That maximum quotation has been substantiated in connection with a few small sales, one producer having obtained it yesterday on a single carload of one size. Other orders call for 100 tons or more at a time with larger tonnage contracts involving 500 to 1000 tons at a time. Bar mills with other steel producing departments are operating on an average of 80 to 85 per cent. Refined iron continues to improve slightly in demand. The price is unchanged at 2.75c, base Pittsburgh.

Mills Decline Tonnage

Cleveland, Feb. 6.—Bar consumers with tonnages already on mill books on which delivery will be spread over several months are having difficulty in getting the mills to accept additional lots. One manufacturing interest in this territory has been endeavoring to place 2500 tons additional with its regular source of supply but so far has been unsuccessful. New demands for steel bars in this territory are steady in good volume but most mills are not desirous of additional tonnage at this time. Leading independent mills now are quoting 6 weeks delivery. Prices are strong but less so than in plates and shapes and while 2.10c, Pittsburgh represents the general market, it is believed 2.00c still could be done on an especially attractive tonnage. The Cambria Steel Co. has advanced to 2.25c, Pittsburgh.

Prices Are Strengthening

Buffalo, Feb. 6.—The price of merchant steel bars for prompt delivery now is 2.15c Pittsburgh, and the market is strengthening. Some bars are being sold for extended delivery at 2.10c, but nothing under this price. Two agencies for outside makers report mills entirely out of the market. Considerable tonnage is being rejected.

Quotations Are Higher

New York, Feb. 6.—January was regarded by sellers in this district as an unusually big month in steel bars. This demand continues to be maintained. As a result of rapidly expanding order books the mills are asking higher prices. While 2.10c base Pittsburgh still can be done with independent producers, the minimum price with some independents now is 2.15c.

Advance Is No Check

Pittsburgh, Feb. 6.—The $3 per ton advance in cold-drawn steel bars reported last week has not checked new business. Orders, together with specifications on old contracts, are sufficiently large individually to furnish mills with attractive rollings. One specification last week called for 300 tons made up of two sizes. Demand is well diversified. Mills are being operated practically full and the receipt of such a heavy aggregate tonnage prevails notwithstanding the fact that it will not be until after March 1 that the large consuming lines, mainly automotive, will really come into the market. As it is, however, fair sized orders already are being received from that direction. Finishing plants say they do not see how they long can avoid another increase since the present level of 2.65c, base Pittsburgh, with merchant steel bars quoted at a minimum of 2.10c, gives but $11 for conversion whereas under the war industries board regime, 1917-1920, $25 per ton was the differential.

Bolt, Nut, Rivet Demand Improving; Prices Firm

NUT AND BOLT PRICES, PAGE 410

Chicago, Feb. 6.—Excellent inquiry for prompt delivery bolts and nuts is being received by makers, who are forced to turn down much of it. Deliveries are slowing up somewhat and users are finding difficulty in obtaining as much material as they need. Prices are strong but have not been advanced, though an upward change is expected before second quarter business is taken.

Buying Is More General

Pittsburgh, Feb. 6.—While buying of nuts, bolts and rivets by railroads and railroad equipment interests continues, present buying is more or less general. Orders are being received from various manufacturing lines. Jobbers continue to order from time to time. Heavy consumption is expected with the coming of spring and summer and jobbers all wish to be equipped with well balanced, if not heavy, stocks. The quoted prices on nuts, bolts and rivets are becoming stronger, concessions under them having largely disappeared. Apparently these have been made by small producers who found themselves short of business and in their haste to accumulate backlogs set aside production costs, etc. Nut, bolt and rivet departments are operating on an average of 80 per cent.

Rivet Prices Stiffening

Cleveland, Feb. 6.—Activity in the bolt and nut market continues to increase with demand coming from practically all consuming interests. One large maker here reports it has had a number of opportunities to double contracts on books at first quarter prices, but in each case has declined the added business. No second quarter business has been taken as yet. Higher prices on second quarter requirements are looked for in view of the constantly increasing demand and the higher prices being quoted on steel bars.

Due to the fact steel supplies are becoming harder to obtain and an increase in demand, rivet prices are stiffening. While some makers still are shading the quoted prices of 3.00c and 3.10c, Pittsburgh, on structural and boiler rivets respectively, the shading is small, and for that matter has practically disappeared.

Hoops in Fair Demand

HOOP PRICES, PAGE 410

Pittsburgh, Feb. 6.—Orders up to several hundred tons at a time have been received by hoop and band makers in the past few weeks and hoop and band departments are operating at a relatively high rate. Individual lots have been larger since the first of the year than they were the latter part of 1922. While 2.75c still is minimum on the part of regular hoop and band producers, up to 2.90c is quoted by hot-rolled strip manufacturers. On narrow sizes and thin gages a spread of 3.00c to 3.25c prevails. During the current week, however, these quotations probably will advance $3 to $5 per ton in harmony with the stronger position occupied by steel products due to advancing production costs.

Furnaces Taking More Ore

ORE PRICES, PAGE 468

Cleveland, Feb. 6.—Shipment of iron ore from Lake Erie ports to furnaces in January amounted to 767,568 tons, compared with 211,533 in January, 1922. The total for the

season to Feb. 1 is 22,548,819, against 13,004,610 in the season preceding. The balance of ore on dock Feb. 1 was 8,466,972 tons, compared with 8,223,216 tons Feb. 1, 1922. Further comparisons follow:

	January	Season	Balance on dock Feb. 1
Buffalo	1,750	312,444	254,452
Erie	504	630,944	490,363
Conneaut	254,674	6,409,477	1,651,056
Ashtabula	321,713	7,744,932	2,393,419
Fairport	65,800	956,040	327,681
Cleveland	62,003	4,232,589	1,780,275
Lorain	23,337	1,089,779	450,270
Huron	15,612	473,192	860,556
Toledo	22,175	699,422	258,900

Wire Output

Is Obligated Well Into the Future—Demand Still Heavy

WIRE PRICES, PAGE 410

Pittsburgh, Feb. 6.—Recent adjustments in the wire products market have not curtailed orders or specifications and most makers are filled up with business well into April. Where output is not obligated for the entire first quarter, the remainder is reserved for regular customers. Demand still is so heavy from manufacturers and jobbers that mills are unable to collect stock backlog which ordinarily they hold back for spot demand in the spring and summer. All of these will have to be met from current production. As stated last week, the leading interest and independents are on the same basis as regards plain wire, 2.55c; annealed wire, 2.70c; and galvanized wire, No. 9 gage, 3.15c, base Pittsburgh, although on nails it continues to name 2.70c, or $2 per ton below the independents who are quoting 2.80c, base Pittsburgh. Wire departments cannot run full because of the shortage of wire drawers, which still exists.

Limit Tonnage on Sales

Chicago, Feb. 6.—Demand for wire and nails continues strong and the leading maker in this market continues to take on business only in proportion to previous buying by various customers, in order to distribute its production as widely as possible. Operation is at the same mark as has prevailed for the past several weeks. Prices are strong and unchanged.

Manganese Ore Easier

New York, Feb. 6.—The manganese ore market is somewhat easier owing to exchange conditions, lower ocean freight rates and the slackening of demand. The last sale which involved 1000 tons of Indian ore, was made at 33 cents per unit, c.i.f. tidewater and this price is considered indicative of the current market both on Indian and Brazilian ore. While supplies for first half shipment from India and Brazil are limited, consumers now appear well covered for the first half and it is regarded as too early to take action on second half. It is understood that in addition to sales previously reported, at least two other cargoes were purchased during the recent buying movement, at approximately the same prices paid for the other lots at that time.

Tank Placements Heavy

Large Plate Tonnages Involved in Week's Awards—Independent Mill Quotes 2.25c as Minimum—Eastern Makers Higher

PLATE PRICES, PAGE 410

Chicago, Feb. 6.—In addition to the heavy demand for plates by railroad car builders, tank work continues to bring in a heavy tonnage to mills. The Petroleum Midway Co., of San Pedro, Cal., has placed an order for oil storage tanks with the Chicago Bridge & Iron Works, requiring 6000 tons of plates, which will be furnished by the leading producers. The Sinclair Oil Co. has placed between 7000 and 7500 tons of plates with the Inland Steel Co. for tank work at Marcus Hook, Penn., including 10 tanks of 55,000 barrels capacity, six tanks of 80,000 barrels capacity and 60 smaller containers. Quotations on tank plates continue at 2.20c to 2.30c, Chicago mill, with the probability that the higher quotation will be still further advanced within the next week or 10 days, when Inland Steel Co. fixes its schedule to apply on its second quarter tonnage. It is understood some Pittsburgh producers are quoting 2.20c, Pittsburgh, and in a few cases 2.25c, Pittsburgh.

Further Advance Is Shown

Cleveland, Feb. 6.—Plate prices continue to advance under a more pronounced shortage of tonnage especially for early delivery. The Midvale Steel & Ordnance Co. has advanced to 2.25c, Pittsburgh, from Johnstown, Pa., but when shipping from eastern plants quotes 2.25c, mill. Other eastern producers are quoting from 2.30c to 2.40c, Pittsburgh and sales for western shipment are reported as high as 2.50c, Pittsburgh. On a lot of 200 tons 2.30c, eastern mill equivalent to 2.56c, Pittsburgh, was named and the prospects are good for the order being placed. One lot of 700 tons was placed about two weeks ago at 2.20c, Pittsburgh. Local mills are asking 2.25c and upward. Larger mills quote 2.10c, Pittsburgh, but this largely is nominal since some of them cannot possibly deliver under three months. A large tonnage continues to be represented by pending vessel construction on the lakes. The Great Lakes Towing Co. is placing the steel, 300 tons, for two tugs. About 1000 tons of oil still work remains in the market as well as numerous lots of oil tank steel. One large oil interest is reported to have placed 12,000 additional tanks in the East.

Canadian Buyers Inquiring

Buffalo, Feb. 6.—Canadian demand for plates has quickened. One inquiry is for 1500 tons, another for 1600 tons. Numerous other protections are out, one involving 10,000 tons of car building material largely plates.

A Buffalo car company is reported to be in the market for 8800 tons of car material, mostly plates.

Refuse 2.25c for Second Quarter

Philadelphia, Feb. 6.—Eastern plate makers are quoting a minimum of 2.25c, Pittsburgh, and 2.10c and 2.15c are disappearing. New demand is good, coming from all directions, and to a notable extent from the West. Included in past week's business is some first quarter contracts at 2.25c. Second quarter contracts are refused by the mills on this basis. Eastern production is increasing, and mills are quoting continuously. One mill's January bookings are heavier than in any previous month in three and one-half years.

Round Tonnage in Market

San Francisco, Feb. 6.—Business in oil tanks continues to call for a round tonnage. The largest new inquiry of the week involved 5000 tons. No action has been taken on the 7500-ton lot for the Mexican Petroleum Co. It is understood the Union Oil Co. has abandoned its plan for 30 80-barrel tanks involving 9000 tons. Bids will be opened Feb. 13 by United States engineers for 105 tons for pontoon pipe. Prices are advancing. One independent quoted 2.55c and 2.60c, c.i.f., San Francisco, for universal and tank plates respectively, and this appears to be minimum. Other interests are quoting 2.65c to 2.75c.

Protections Are Asked

Pittsburgh, Feb. 6.—Protections on various tonnages of plates for tank and barge work are being asked by different fabricators. Several received recently aggregate 3000 tons. One or two are out for specific tank work involving 7000 to 10,000 tons. The inquiry of the Pan-American Oil interests for a large number of tanks still gives promise of early closing. This involves approximately 30 80,000-barrel tanks. The Texas Co. last Saturday placed with the Petroleum Iron Works Co. orders for 25 80,000-barrel tanks involving about 7500 tons of steel, mostly plates, for the Port Arthur, Texas, district. The Treadwell Engineering Co. has a plate inquiry out for a round tonnage for barge work. The Penn Bridge Co., Beaver Falls, Pa., has been awarded a contract for 14 barges for the United States government's engineering departments, one for Paducah, Ky., two for Evansville, Ind., four for Eddyville, Ky., and seven for Mobile, Ala. These involve approximately 3000 tons of plates. The market on plates still is quoted at 2.10c to 2.25c.

Several Tonnages Placed

New York, Feb. 6.—The Texas Co., New York city, which has been in the market for 13,000 tons of tank work, has closed on 7500 tons to the Petroleum Iron Works. It is understood that action on the remainder has been postponed indefinitely. The Sinclair interests have closed on a similar tonnage, which, it is reported, was divided between the Petroleum Iron Works and the Chicago Bridge & Iron Works. The Sinclair interests have been inquiring for 16,000 tons of oil tanks.

Scrap Exhibits Strength

Price Trend Upward Despite Lack of Buying in Some Centers—Scarcity of Some Grades Threatens—Few Railroad Offerings

SCRAP PRICES, PAGE 472

Chicago, Feb. 6.—The feature of the iron and steel scrap market is the strength of low phosphorus grades, which are in demand by steel foundries. The supply is relatively small, railroad specialties, such as knuckles and couplers, being in small tonnage and picked up promptly at high prices. Steel grades for mill melting are inactive since the large purchases of an independent company two weeks ago. The leading steelmaker shows no signs of entering the market. Gray iron foundries continue to buy cast grades and this department is steadily active. Offerings of railroad scrap are not large at present, though some large lists have been offered and closed recently. The Pere Marquette railroad offers 1500 tons and the Chicago & Alton 500 tons.

Foundries Clamoring for Cast

Detroit, Feb. 6.—Although prices on some grades of scrap are showing strength dealers report the possibility of an easier tone soon. Many medium sized foundries are clamoring for cast scrap and offering premiums for supplies. The continued scarcity of cast is causing some apprehensions. Consumers are not entering the market to any extent but this week representatives of mills have visited the larger automobile plants and other producers of scrap which is taken as an indication that direct business along this line is being negotiated.

Malleable scrap is scarce and has been advanced $2. Loose sheet clippings stove plate and busheling of all grades are up another 50 cents a ton. Heavy grades of steel scrap are unchanged. An easier market in this line is expected. The freight situation is causing some concern as embargoes are becoming more stringent.

Improved Conditions in South

Birmingham, Ala., Feb. 5.—The scrap iron and steel market here is improved and prices are firmer. The foundries are buying more freely and indications point to an active market for several months. Old material yards are being kept well supplied. No. 1 cast still is the most active of all grades. Cast iron pipe shops of the Birmingham district, the heavy melters of scrap, are well booked up with business and the old material dealers anticipate a strong demand from that source.

Market Exhibits Strength

New York, Feb. 6.—From a situation of relative easiness last week, the local scrap market has become one of exceptional strength. Prices have advanced all down the list, and in some instances the increases have been most pronounced. Eastern Pennsylvania consumers are freely offering $21 to $22, delivered, for heavy melting steel; $20 to $21, delivered on specification pipe; and $24.50 to $25 on cast iron car wheels. Advances of $1 and more also are being offered on all other grades of cast scrap, borings and turnings, shafting and steel axles. In fact, there is a strong demand for practically all grades. The cause of this sharp increase is due to an almost complete tieup in shipments out of New England, where car shortage and unfavorable weather conditions have retarded transportation seriously. It generally is believed that there will not be much scrap coming out of New England for at least a month. At the same time, this congestion fast is spreading in the metropolitan district, heavy accumulations beginning to appear at the various terminals. This development takes on a particularly serious aspect in view of the fact there was already a rapidly growing scarcity of scrap. Railroad offerings for weeks past have been exceptionally light.

Prices Continue Upward

Boston, Feb. 6.—With improved demand for heavy melting steel and stove plate from Pennsylvania consumers and more interest in all cast grades on the part

(*Concluded on Page* 429)

Semifinished Advancing

Makers Asking More for Sheet Bars, Billets and Slabs—Wire Rods Offered at $50 in East—Material Still Scarce

SEMIFINISHED STEEL PRICES, PAGE 410

Pittsburgh, Feb. 6.—As has been evident in the semifinished material market for some time, prices continue to advance. Those mills seeking sheet bars find a number of sellers who are quoting $40 against a nominal market of $38.50, Pittsburgh or Youngstown. Interests not ordinarily factors in the open market again are understood to be seeking tonnage but in all probability will encounter difficulty in developing anything below $39.50. While some large tonnages of bessemer billets recently were closed at under $38.50, Pittsburgh, that has been the minimum on several lots of 4 x 4-inch open-hearth billets disposed of within the past several days. Buyers in several directions have absorbed all excess offered by a local interest.

Users not now under contract will have considerable trouble in locating steel. Even some now under contract are complaining about not receiving scheduled deliveries. One producer obligated to deliver 2300 tons weekly can only get out about 500 tons. A Cincinnati district producer likewise is experiencing an iron shortage and is finding it difficult to make good its slab obligations. Forging billets continue to sell at $47.50, Pittsburgh, in lots of 50 to 450 or 500 tons at a time. A few lots of this grade recently went at $45 but that figure is said to be no longer available.

Several sellers of wire rods now believe they will be unable to make deliveries on some of the wire rod obligations taken on when they were short of wire drawers. The labor shortage still exists, but they are needing more and more steel in their wire departments and so cannot consider a ton of new wire rod business. From $47.50 to $50, Pittsburgh, is quoted. Apparently plenty of room exists for all the skelp business producers care to accept, several inquiries being current for fairly sizable lots. Some buyers are not so much concerned over price as they are about deliveries, there being a scarcity of skelp as well as other forms of semifinished material. From 2.10c to 2.25c are the usual market quotations.

Wire Rods Available

New York, Feb. 6.—Owing to railroad embargoes and consequent inability to ship to some consumers, some steelmakers have wire rods to sell and some sales have been made to unembargoed consumers during the past week at $50 base, Pittsburgh. The market is $45 and $50, but it is difficult to place any tonnage at less than $50. Prices on billets are tending upward and it is not believed that $40 could be shaded on open-hearth rerolling grades. On forging billets the market is $45 to $47.50, base Pittsburgh, with the tendency toward the latter figure as the minimum.

Shortage Is More Acute

Youngstown, O., Feb. 6.—District producers of semifinished material continue out of the market in view of the acute shortage of raw steel. In fact 10 finishing mills suspended operations this week to permit the execution of sheet bar obligations according to schedule. The shortage of semifinished likely will continue for weeks in view of current intermill requirements; open-hearth capacity engaged at present stands at 88 per cent and any increase in this direction will not augment the supply of semifinished to any marked extent. Unsolicited sheet bar business involving a round tonnage was offered a district maker this week at $40, Youngstown but was declined. No prices can be obtained from producers of semifinished here. The market purely is nominal with February prices yet to be named.

Ask More for Forging Billets

Cleveland, Feb. 6.—Eastern mills which have been active in selling forging billets in this territory during the last few weeks continue to do a considerable volume of business here, and have now advanced their price from $45 to $47.50, base Pittsburgh.

Wire Rods Sold at $50

Philadelphia, Feb. 6.—Several lots of wire rods have been sold at $50, Pittsburgh, this being the minimum of independent makers. In some cases $53 has been quoted. Forging billets have sold at $45 and $47.50. Rerolling billets are mostly $40, al-

though $38.50 has not entirely disappeared on large tonnages.

Tin Plate

Specifications Continue Heavy—New Business Still Is Limited

TIN PLATE PRICES, PAGE 410

Pittsburgh, Feb. 6.—Specifications on tin plate continue heavy although new orders are limited. While occasionally a block of new business develops for oil or general line cans, or for food container tin plate, the bulk of shipments from now on until well into the second quarter will be on contracts. Large tonnages are going West for fish, fruit and vegetable packs which this year will be abnormally large. Relatively small tonnages, however, are going via all-rail routes because of the much lower freight rates by rail and water via Baltimore. For instance out of a total of 3,000,000 base boxes scheduled for shipment to the West coast territory this year perhaps 60,000 are routed "all-rail." The contemplated rate reduction on March 7 from $1.20 to 75 cents from Chicago to the West coast will not greatly aid the situation since the rail and water route even with extra costs for packing aggregates 70 cents. It is probable only those western users who cannot afford to wait the extra time consumed by rail and water shipments will specify all-rail deliveries. The ma price continues $4.75 per base box, 100 pounds, Pittsburgh.

Price Is Firm

New York, Feb. 6.—It is understood the Standard Oil Co. of New Jersey closed its recent inquiry for 60,000 boxes of tin plate. The market on contract tin plate continues firm at $4.75 base Pittsburgh, while stock list material is bringing all the way from $4.50 to $4.75.

Orders recently placed by the Standard Oil Co., New Jersey, with Welch makers are reported to have aggregated 400,000 boxes of tin plate or 20,000 tons. Some of these orders already had been reported. The price is understood to have been from $4.55 to $4.65 per base box delivered Bayonne, N. J.

Expect Strip Advance

Pittsburgh, Feb. 6.—During the current week, possibly strip steel will join the other steel products which recently have registered an advance of $3 to $5 per ton. The prices have been 4.50c on cold-rolled with 2.75c to 2.90c, base Pittsburgh, representing the spread of the market on hot. Demand continues to be well sustained and comes from different consuming lines in many directions. In this respect, the present situation is unchanged, having applied for several weeks past. Makers are practically out of the market for all of the first quarter, being able only to take business on certain sizes and gages for shipment this side of April 1. Individual orders have been increasing in size and some exceedingly attractive rolling schedules have been possible involving one to several carloads at a time.

Sheet Prices Are Rising

Mills Unable To Meet Demands Fully—Labor Shortage Tending To Slow Down Operations in Some Centers—More Valley Makers Suspend

SHEET PRICES, PAGE 410

Pittsburgh, Feb. 6.—Efforts to buy more sheets than they have coming to them are unrelenting on the part of manufacturers and jobbers. Actual specifications in hand are heavy and output for many weeks, in some cases to the end of the second quarter, has been obligated and one or two large makers cannot grant deliveries this side of July on any new business that may be offered for their consideration. Where quotas have been allotted, not a week goes by but that requests for additional tonnage are received. This heavy interest in sheets applies practically to all grades, particularly as regards the American Sheet & Tin Plate Co. although it may be possible in intervening weeks to accept small additional tonnages of blue annealed for one mill, or black for another to work in with other rollings.

Labor costs are high, not so much from the wage standpoint as from the special inducements in the way of railroad fares, maintenance of commissary and other departments of convenience, and several other features which have had to be adopted to make the work attractive. Competition and scouting for hot mill hands is keen. Even with these special inducements, men often stay but two or three days on a job. Because of curtailed sheet bar deliveries as well as a shortage of labor, the operating schedules of the leading interest slipped this week from the preceding week's 90 per cent mark. Around 89 per cent will probably be maintained the current week, independents continuing to average 85 to 90 per cent.

One or two other independents have joined those who now are naming higher levels such as have been quoted by the Brier Hill Steel Co., Youngstown, O., the Bethlehem Steel Co. in the East and the Inland Steel Co. in the West for some time past. A West Virginia sheet maker and a Kentucky manufacturer are the latest to join those naming the higher market prices. The latter is said to be quoting 4.65c on galvanized, although continuing to quote a maximum of 3.50c on black. Thus the spread between black and galvanized is widening in one or two instances, mainly because of the high cost of spelter. In this particular case it is $1.15 instead of $1 on the No. 28 gage. The American Sheet & Tin Plate Co.'s prices of 2.50c, 3.35c, 4.35c and 4.70c, all base, Pittsburgh, on blue annealed, black, galvanized, and full-finished automobile sheets, respectively, soon will be entirely nominal. From 2.65c to 2.75c is being named on blue annealed in many directions; around 3.50c easily is obtainable on black; 4.50c to 4.65c is the current spread on galvanized, and 4.85c to 5.00c on full-finished automobile sheets.

Higher Price Due Soon

Chicago, Feb. 6.—Higher prices on steel sheets will be announced by Inland Steel Co. about Feb. 12 to 15, applying on second quarter tonnage, which will be allocated at that time among regular customers. It is not known how much increase will be made but $2 to $3 per ton is considered inevitable. At the same time the spread of galvanized over black may be made greater than $1 which has prevailed, as a result of the high price of spelter. Users generally are in need of more sheets than their contracts with Chicago mills will supply them, and are buying in the East. Lately they have experienced difficulty in placing business there as mills have filled up.

More Valley Mills Suspend

Youngstown, O., Feb. 6.—Conditions in the sheet market here are identical at all sources of supply. The mills are out of the market indefinitely and when conditions warrant the furthering of obligations, considerably higher prices will be named. Early this week the Sharon Steel Hoop Co. advanced its prices $5 a ton and has no black or galvanized to offer at less than 3.60c and 4.60c, base Pittsburgh. The United Alloy Steel Co., Canton, O., recently advanced its sheet prices $3 a ton and now is holding black at 3.50c and galvanized at 4.50c, Pittsburgh, with but little tonnage of either grade to offer. Galvanized h been quoted at 4.50c by several district makers since the first of this year while others have suspended operations in their galvanizing department rather than operate at a loss. With sheet bars unobtainable at $40, Youngstown, demand unsatisfied and mill schedules booked tightly at a close margin of profit, sheet prices are bound for higher levels, according to a close student of market conditions, and present prices of 3.35c for black and 4.35c for galvanized merely are gliding along until prices on sheet bars for February shipment are announced. Twenty-three sheet mills suspended operations this week due to the shortage of sheet bars reducing the rate of activity from 89 to 75 per cent of valley capacity.

Eastern Prices Stronger

Philadelphia, Feb. 6.—Sheet prices are rising and 2.75c, Pittsburgh now is minimum on blue annealed with some independents. The latter are beginning to quote 2.90c, 3.50c and 4.50c as the minimum on blue annealed, black and galvanized. Some makers are not quoting on galvanized business, being sold up.

Spar Sales Limited

Pittsburgh, Feb. 6.—Consumers of fluorspar now coming into the market for limited quantities, apparently are able to obtain these through middle hands somewhat below regular prices. In some cases, however, delivery appears to be doubtful. Most consumers are under contract and deliveries are being made regularly. All of these contracts carry the $21.50 f.o.b. Kentucky or Illinois mines, price. One contract for first half requirements recently booked is that of the American Radiator Co. for 600 to 800 tons.

Seek Protection on Shapes

Eastern Buyers Endeavor To Place Tonnage on Pound Price Basis as Quotations Rise—Mills Heavily Booked

STRUCTURAL SHAPE PRICES, PAGE 410

Chicago, Feb. 6.—Booking of structural material by fabricators continues at an unusual rate for winter and the aggregate tonnage placed in the Chicago market recently is heavy. No letup in demand for structural material has appeared and in spite of the heavy bookings the tonnage still under negotiation is large and promises to be more than fabricating shops can accommodate. It appears that two important fabricating interests are waging a quiet war for tonnage and this makes it difficult for smaller interests to compete successfully for important prospects. Considerable tonnage is being placed at Chicago for various work connected with the Chicago Union Station. Plain material is still quoted at 2.20c, Chicago mill, but an increase of $2 or $3 per ton is likely to be made shortly by the leading independent producer to apply on its second quarter tonnage, which will be allocated shortly.

Builders Rush for Protections

New York, Feb. 6.—With prices on shapes and fabricated material steadily tending upward, builders continue their rush to get protected, and in numerous cases, prospective buyers are endeavoring to place tonnage on a pound price basis, without drawings anywhere near completed. Fabricators, generally, however, are loathe to accept business on this latter basis, particularly in view of uncertainty as to future costs. The labor shortage, it is said, is becoming more pronounced daily, with an accompanying upward tendency in wages.

While the market on shapes may still be quoted at 2.10c to 2.25c, Pittsburgh, on the bulk of current business, premiums of at least 10 points are now being asked in some instances for nearby shipment. The market is exceptionally strong, and one leading independent reports a heavier tonnage on its books

Local Tonnages Relatively Small

Pittsburgh, Feb. 6.—While large tonnages of structural shapes are being placed in other sections of the country, mainly East and West, territories adjacent to Pittsburgh, are furnishing contracts only for relatively small lots. All Pittsburgh fabricators report that raw material continues to advance, prices from 2.15c to 2.25c, Pittsburgh, being encountered. The absolute minimum of the market is 2.10c, various contracts being billed at that level. Prices of material fabricated and erected, however, still are out of line and this is traced to the large number of small fabricating shops which need work

Deliveries Are More Difficult

Cleveland, Feb. 6.—Structural activity, at least on a sizable scale, continues at about the same rate as during recent weeks. Only one award, and that involving but 200 tons of steel, was made in this vicinity during the week just past. This tonnage for the United Cigar Stores Co.'s building at Akron, O., went to the Riverside Bridge Co. Numerous inquiries are out but all are for less than 500 tons. Prices are strong with delivery becoming an important factor. One eastern mill recently sold in this district a fair tonnage at 2.25c, Pittsburgh. The Cambria Steel Co. has advanced to 2.25c, Pittsburgh. The minimum price that can be obtained remains at 2.10c, Pittsburgh, for attractive tonnages, although more sales are being made at 2.20c and higher. Some producers quoting for western delivery are asking 2.50c, Pittsburgh, or 2.30c, eastern mill.

Demand Passes Production

Philadelphia, Feb. 6.—Structural shape demand consists mostly of small lots but the total is in excess of current production. This is caused particularly by western buying. The prices of 2.10c and 2.15c, Pittsburgh, have not disappeared entirely but most makers are quoting 2.25c, Pittsburgh, as a minimum. One mill is asking as high as 2.35c, Pittsburgh.

CONTRACTS PLACED

Awards reported this week .... 31,773 tons
Awards reported last week .... 47,787 tons
Awards reported two weeks ago.. 43,668 tons

6500 tons, Hotel Cadillac, Detroit, to Bethlehem Fabricators, Inc.
4020 tons, Chicago Union Station Co.'s portion of Roosevelt road viaduct, Chicago, to American Bridge Co.
3600 tons, outbound freight house at Harrison street terminal of Chicago, Burlington & Quincy railroad, Chicago, to Bethlehem Steel Corp.
3500 tons, plant for Ford Motor Co., Walkerville, Ont., to Canadian Bridge Co.
2400 tons, Y. M. C. A. building, New York, contract to Post & McCord rescinded, and placed with Harris Structural Steel Co.
2000 tons, Ford building, Danforth avenue, Toronto, Ont., to Canadian Bridge Co.
2000 tons, buildings for Toronto Transportation commission, Toronto, Ont., to Dominion Bridge Co.
1800 tons, plant addition for Anaconda Copper Mining Co., Miami, Ariz., to independent.
1700 tons, store addition for T. Eaton Co., Toronto, Ont.; to McGregor & McIntyre.
1600 tons, track elevation, Long Island railroad, previously reported placed, awarded to Shoemaker-Satterthwaite Bridge Co.
1312 tons, Carpenter building, Grand avenue and 6th street, Milwaukee, Wis., to Worden-Allen Co.
1300 tons, office building for Life Insurance Co. of Virginia, Richmond, Va., to American Bridge Co.
900 tons, freight terminal building, Pennsylvania railroad, Detroit, to the American Bridge Co., Pittsburgh.
900 tons, apartment on Seventy-second street, New York, to Hinkle Iron Co.
800 tons, Redford building, Toronto, Ont., to Dominion Bridge Co.
787 tons, bascule bridge over Calumet river, Burnham, Ill., to Strobel Steel Construction Co.
750 tons, bridge repair work on the Buffalo, Rochester & Pittsburgh railroad to the American Bridge Co., Pittsburgh.
750 tons, Roosevelt road viaduct, Chicago, to Milwaukee Bridge Co.
700 tons, garage, Broadway and 185th street, New York, to Hay Foundry & Iron Works.
690 tons, building for Kansas City joint stock land bank, Kansas City, Mo., to American Bridge Co.
664 tons, deck and through plate girder spans, in Oklahoma, Chicago, Rock Island & Pacific railroad, to American Bridge Co.
600 tons, factory building for Congoleum Co., Marcus Hook, Pa., to Shoemaker-Satterthwaite Bridge Co.; this is in addition to the 600-ton unit awarded last week to the McClintic-Marshall Co.
600 tons, Howard Ware department store, New Rochelle, N. Y., to Hinkle Iron Works.
600 tons, Central Finance building, Los Angeles, Cal., to Llewellyn Iron Works.
600 tons, warehouse for city of Los Angeles, to Baker Iron Works.
500 tons, building for United Cigar Stores, Inc., Akron, O., to Riverside Bridge Co.
500 tons, factory, for W. H. Luden, Reading, Pa., to McClintic-Marshall Co.
500 tons, plant addition for Reading Hardware Co., Reading, Pa., placed through John W. Ferguson, with McClintic-Marshall Co.
500 tons, boiler house for Standard Oil Co. of New Jersey at Bayonne, awarded an unnamed fabricator.
450 tons, 9-story apartment in East Fifty-second street to the Harris Structural Iron Works.
413 tons, machine shop for Link-Belt Co., Chicago, Ill., to Morava Construction Co.
400 tons, bridges for C. & O. railroad, to American Bridge Co.
350 tons, ice plant, Sheepshead Bay, Long Island, to Hinkle Iron Works.
300 tons, building for Union Carbide Co., Sault Ste. Marie, Mich.; fabricator not known.
270 tons, paint shop for the Pullman Co., to Union Foundry Co., Chicago.
220 tons, Wilsonian apartment hotel, Seattle, to Reliable Iron & Wire Works; Puget Sound Bridge & Dredging Co., general contractors.
150 tons, annealing shop for South Side Malleable Casting Co., Milwaukee, to Lakeside Bridge & Steel Co.
147 tons, auditorium and library wing for teachers' college, Mankato, Minn., to St. Paul Structural Steel Co.

CONTRACTS PENDING

5000 tons, George Washington high school, New York; John T. Brady, general contractor, low bidder.
2700 tons, office building, Liberty and Broadway, New York City; Fred T. Ley; bids asked.
2500 tons, Olympic hotel, Seattle, Wash.; George P. Post, architect, New York City; bids being taken.
2000 tons, building for Bell Telephone Co., of Canada, Toronto, Ont.; pending.
809 tons for Cherry street bridge at Appleton, Wis., bids opened Feb. 7.
700 tons, addition for Robert Simpson Co., Toronto, Ont.; pending.
600 tons, Sacramento high school, Sacramento, Cal.; Palmer Iron Works low bidders.
500 tons, addition for Bank of Buffalo, Buffalo; bids asked.
400 tons, extension to plant for Colson Co., Elyria, O.; bids asked.
400 tons, two bridges for New York Central railroad, at Cayuga, N. Y.; Shoemaker-Satterthwaite Bridge Co. low on one and American Bridge Co. on other.
300 tons, new plant for Ingram-Richardson Corp., Bayonne, N. J.; action deferred last August, again up for bids.
300 tons, building for Phoenix National bank, Hartford, Conn.; bids asked.
300 to 400 tons, theater and store for Comuntzis Brothers, Morgantown, W. Va.; bids being taken.
300 tons, Ellwood City, Pa. school; bids close Feb. 13.
200 tons, parochial school, 207th street, New York; bids asked.
200 tons, factory addition, for Galion Iron Works & Mfg. Co., Galion, O.; redesigned and new bids asked.
200 tons, two schools, Massilon, O.; Washington high school and Lorain Andrews school each requiring 100 tons; bids in Feb. 14.
170 tons, high school, Pine and Portage road, Niagara Falls, N. Y; bids asked.
150 tons, Albert hotel addition, New York; bids asked.
150 tons, building for Atlas Savings & Loan Co., Broadway & Fifty-fifth street, Cleveland; bids asked.
130 tons, extension to galvanizing plant of Falcon Steel Co., Niles, O.; bids being taken.
120 tons, boiler house for Otis Steel Co.; bids taken.
100 tons, building for Atlas Foundry Co., Cleveland; bids in.
100 tons, community building, Bloomfield, N. J.; bids asked.
Tonnage not stated, for power station at Grand Island, Neb., bids asked.

Few Inquiries

Now Are Current for Various Ferroalloys—Prices Are Steady

FERROALLOY PRICES PAGE 410

New York, Feb. 6.—Although the ferromanganese market is far from

active demand is maintained steadily and at least 2000 tons of English metal have been sold during the past week by importers in New York. The price done in all instances was $107.50 duty paid tidewater.

Sales of spiegeleisen during the past week aggregated 200 to 300 tons which went at $36 to $37 furnace for 20 per cent metal. The market may be quoted at $34 to $37 although the lower price has not been done for at least two weeks and would be good only in connection with large contract tonnages.

Several fairly good sized lots of manufactured tungsten have been sold recently at prices ranging from 86½ cents for ferrotungsten to 95 cents for tungsten powder. Tungsten ore prices are unchanged, with small quantities still obtainable at $750 a unit Domestic makers of 4 to 6 per cent carbon ferrochrome have reduced their price from 13 to 12 cents a pound contained. Good sales of 1 to 2 per cent carbon ferrochrome have been made to makers of certain special steels, both by domestic manufacturers and by importers, at prices ranging from 28 cents on foreign alloy to 30 cents for domestic alloy. Sales of 50 per cent ferrosilicon have been made in carlots at $87.50. Consumers generally are well covered by contract for 1923. High speed steelmakers have been buying ferrovanadium more freely, at $3.50 a pound contained. Absorption of the open-hearth grade by the automotive industry and locomotive builders has been at a high rate.

New Sales Are Few

Philadelphia, Feb. 6.—No additional sales of ferromanganese have been reported in this district the past week. The market is firm at $107.50, duty paid tidewater or at domestic furnace. Several hundred tons of spiegeleisen have been sold by a steelmaker at $36, furnace, for 20 per cent.

Small Sales Are Current

Pittsburgh, Feb. 6.—While some fairly sizable lots of English ferromanganese lately have been closed, the buying of domestic material has slackened considerably. Only one or two carloads sales are noted here at $107.50 seaboard base or $112.29 delivered Pittsburgh. Inquiries for small lots are fairly numerous, including one from a Wheeling, W. Va., consumer, a local steel castings manufacturer, and a few others. One of the largest inquiries current in recent weeks involves 500 tons from a western user. Other alloys remain quiet, only one or two inquiries for small lots of 5 to 10 tons each of ferrochrome being noted. A similar number of ferrotungsten requirements is current as well, 10,000 or 15,000 pounds each. The market on prime ferrotungsten is around 90 to 95 cents, although some sellers are quoting as low as 85 cents for ferrotungsten with impurities.

Spiegeleisen now is quoted in carload lots at $36 and $37 for 16 to 19 per cent, and 19 to 21 per cent material, respectively, an advance of $1. Prices on larger tonnages too, are higher as indicated a week ago. Inquiries are few the only new one being a carload for the Pacific Coast.

Car Buying Shows Letup

Awards Lighter Than During Recent Weeks Largely Due to Delayed Steel Deliveries—Light Rail Prices Are Advanced

RAILROAD TRACK MATERIAL PRICES, PAGE 410

New York, Feb. 6.—Car awards during January, according to the monthly compilation, totaled 13,390. Compared with the 23,255 freight cars awarded in December, the January total is but slightly better than half those of the previous month. Locomotive awards during January totaled 586. Following is the monthly comparative statement for 1922 and January, 1923:

January, 1923	13,390
December	23,255
November	18,500
October	12,700
September	10,350
August	1,610
July	13,700
June	13,100
May	18,250
April	31,500
March	12,000
February	14,500
January, 1922	11,000
1922 total	180,465

Car buying in this district the past week has again been light, with new inquiries rather small and scattered. Locomotive demand, however, is holding up well, the outstanding order calling for 30 locomotives for the New York, Chicago & St. Louis, awarded to the Lima Locomotive Works. Other leading orders call for 12 switch engines for the Oliver Iron Mining Co., placed with the Lima Locomotive Works; and five for Chicago Junction, placed with the Lima Locomotive Works. New inquiry includes 50 for the Great Northern; 11, including nine switch engines, for the Bingham & Garfield, and three for the Akron, Canton & Youngstown. The American Locomotive Co. booked 30 locomotives for the Buffalo, Rochester & Pittsburgh railroad and 14 tank engines for the Quebec Development Co.

Buying Is Limited

Chicago, Feb. 6.—Although bids are out on about 20,000 freight cars, relatively little buying was done during the past week. In all, 800 freight cars and 62 passenger cars were placed with builders. Inquiry continues to come out, but at present is for small lots. This situation doubtless is due to the inability of builders to give nearby delivery, on account of their crowded order books. Mills are receiving considerable inquiry for steel to be used in miscellaneous freight car repairs, the Ryan Car Co. and the Streater Car Co. at Chicago seeking about 10,000 tons of steel for this purpose. Demand for track fastenings is excellent and they are being sold in moderate sized lots. Specifications against contracts for track material are being filed to the full tonnage. Demand for light rails is improving. Rolled steel wheels are active and unusually large sales are being made.

Taking Only Small Lots

Pittsburgh, Feb. 6.—Coal companies continue to take the bulk of the tonnage moving in light rails both on contracts and in connection with the small spot orders placed from time to time. However, southern lumber camps are furnishing a fair tonnage of specifications. Considerable single carload business is noted from week to week, although in the case of large coal interests with several affiliated companies five or more carloads at a time usually are ordered with shipping instructions to send one to each operation. Light rails have been advanced to 2.25c, base Pittsburgh. Rerolling mills continue to quote below 2.15c.

Although not much in the way of new business is developing in connection with track accessory business, operations still are high on old contracts against which specifications are forthcoming from time to time. Standard spikes have been quoted here at a minimum of 2.90c for two or three weeks past in carloads; 3.00c, base Pittsburgh, for smaller quantities. Small, boat and barge spikes are being sold at 3.50c, tie plates are quoted at $49 to $53 per net ton, and track bolts are bringing 3.85c in carloads and up to 4.50c for smaller quantities.

More Locomotives Placed

Cleveland, Feb. 6.—An order for 10 locomotives for the Mobile & Ohio has been placed with the Lima Locomotive Works. The same builder it now develops received 40 locomotives from the Nickel Plate instead of 28 as reported a week ago.

CAR ORDERS PLACED

Mobile & Ohio, 500 box cars, 200 hopper cars, 100 stock cars to American Car & Foundry Co.
Interstate railroad, 500 hopper cars to Pressed Steel Car Co.
Atlantic Coast Line, 500 underframes and superstructures to Virginia Bridge & Iron Co.
Pittsburgh railways, 50 street cars to St. Louis Car Co.
Southern Pacific railroad, 575 general service cars to the Ralston Steel Car Co.
General Petroleum Corp., 21 tank cars to Pennsylvania Tank Car Co.
American Tar Products Co., 200 tank cars to Standard Tank Car Co.
Lion Oil Co., 100 tanks to Chicago Steel Car Co.
Willcox Oil & Gas Co., 100 tank cars to Standard Tank Car Co.
Central of Vermont, 10 miscellaneous coaches, to be built in Grand Trunk shops.
Swift & Co., 200 refrigerator cars to own shops.

CAR ORDERS PENDING

Utah Copper Co., 50 ore cars, pending.
Buffalo & Susquehanna, 200 hopper car bodies, bids asked.
Carolina Clinchfield & Ohio, underframes and superstructures for 10 caboose cars, bids asked.
Elgin, Joliet & Eastern railroad, 300 dump cars and 500 gondolas, pending.
Duluth, Missabe & Northern railroad, 100 box cars, pending.
Michigan Central railroad, 100 hopper cars, pending.
American Tank Car Corp., 600 steel underframes, pending.
Carbo Steel Products Co., 50 flat cars; bids asked.
Buffalo, Rochester & Pittsburgh, 16 miscellaneous coaches.
United Verde Tunnel & Smelter Co., 15 ore cars; bids asked.
Buckeye Coal Co., 100 mine cars; bids asked.
Robert Gage Coal Co., 100 gondolas; bids asked.
Calumet & Arizona Mining Co., 25 automatic dump cars; bids asked.
Marion Westmoreland Coal Co., 50 hopper cars; bids asked.
Union railway, 100 flat car bodies; bids asked.
Pittsburgh Plate Glass Co., 285 hopper cars, bids asked.
Southern railway, 1600 center constructions, bids asked.

Concrete Bar Awards Big

Contracts Placed in Week Total 13,602 Tons—Inquiries Continue To Come In—Prices Strengthen

REINFORCING BAR PRICES, PAGE 410

Pittsburgh, Feb. 6.—To represent the market on concrete bars properly the warehouse quotation of 2.50c, base Pittsburgh, must receive consideration since in certain directions no mill prices are available and that figure alone is being quoted. For instance it is understood to be the present quotation basis for the Concrete Steel Co. Since some producers of concrete bars from billets have a minimum quotation of 2.10c and are filling contracts on that basis, the full spread of the market is 2.10c to 2.50c, base Pittsburgh. Numerous inquiries are up indicating a large consumption during the spring and summer. The P. H. Kelly Construction Co. is low bidder on the Peabody high school annex, and the steel, 300 tons, in all probability, will be furnished by the Concrete Steel Co. This interest is understood to be low bidder on the 400 tons of bars needed in the new building of the Pittsburgh Meter Co., and recently received an order for 100 tons for the apple storage building for the Morgan County Cold Storage Co., Berkeley Springs, W. Va.

Dealers Forced to Withdraw

Boston, Feb. 6.—Demand for concrete bars direct from mills exceeds delivery and some dealers have been forced to withdraw from the market. Prices are firm at 2.10c, Pittsburgh. Warehouse prices, however, in contrast are soft in places. One dealer is quoting 2.87c on bars for warehouse delivery. New work is heavy.

New Work Coming Out

New York, Feb. 6.—Demand for concrete bars has broadened generally with New York City lagging slightly behind the other eastern territories. A good deal of important work has been let in the Philadelphia district and at southern points. More new work is coming out. Due to the sold-up steel market bars are harder to get. On mill shipments the market is 2.10c, base Pittsburgh, minimum, with some sales at 2.15c. Due to difficulty of getting mill deliveries, most of the concrete bar sales are for shipment out of warehouse stocks. While there are some price irregularities, the minimum on new business for warehouse shipment appears to be 2.50c, base Pittsburgh.

Bar Buying Freaks Record

Chicago, Feb. 6.—All records as to the number of reinforcing bar sales have been broken by business taken the past week in this territory. The fact is the more remarkable because of the season in which it has been sold. Winter is having less effect on building and projects are little delayed by weather conditions. In addition to tonnages reported by dealers, involving more than 100 tons each, a large number of smaller lots have been booked, making a total of about 7000 tons which is far in excess of any previous week. Most dealers are becoming so well booked they cannot take on much more tonnage except for deferred delivery. There remains in the market a large number of important projects which will require a large tonnage. Prices are at a minimum of 2.75c, Chicago, warehouse, on the part of most dealers, though it is possible some bars may be bought at 2.65c, Chicago, from some sources.

Seasonal Lull in Effect

Cleveland, Feb. 6.—Sales of concrete bars in this locality continue to be made only in small lots. Practically no work of any proportions has been taken in the last week. A few more inquiries have come out than last week indicating that the seasonal inactivity may be nearing an end. So far building construction has been little affected by weather conditions. Prices remain the same as during the past two weeks, namely, 2.00c to 2.10c Pittsburgh.

CONTRACTS PLACED

Awards reported this week .....13,602 tons
Awards reported last week ..... 5275 tons
Awards reported two weeks ago .... 6001 tons

1000 tons, power house for Philadelphia Electric Co., Philadelphia, to Concrete Steel Co.
1000 tons, building for Victor Talking Machine Co., Camden, N. J., to Concrete Steel Co.
800 tons, building for Gimbel Bros., Milwaukee, to Inland Steel Co.
750 tons, building for Godman Co., Columbus, O., postponed indefinitely.
700 tons, buildings for Toronto Transportation commission, Toronto, Ont., to Dominion Bridge Co.
580 tons, United States Veterans hospital at Tupper Lake, N. Y., to Concrete Steel Co.
550 tons, hotel at Fourth and Wells streets, Milwaukee, to Corrugated Bar Co.
500 tons, insurance building, Boston, to Barker Steel Co.
450 tons, hotel at St. Petersburg, Fla., to Concrete Steel Co.
450 tons, Forest Park school, Baltimore, to Hartmann, Duncan & Rogow, Inc.
400 tons, power house for Appallachian Power Co., Glen Lynn, Va., to Concrete Steel Co.
400 tons, for bachelors hotel, Milwaukee, to Corrugated Bar Co.
400 tons, building for the Milwaukee Electric Railroad & Light Co., to Kalman Steel Co.
400 tons, building for Waldorf Boxboard Co., St. Paul, to Kalman Steel Co.
400 tons, 28 hospital buildings for United States veterans, Tacoma, Wash., to Pacific Coast Steel Co.
350 tons, highway work in Illinois, to Concrete Steel Co.
350 tons, Commodore hotel, Chicago, to Concrete Steel Co.
350 tons, Doctors and Dentists building, Milwaukee, to Corrugated Bar Co.
300 tons, transfer dock for Marquette Cement Davenport, Iowa, to Corrugated Bar Co.
300 tons, Hell Gate power plant, New York City, to Truscon Steel Co.
300 tons, Causeway, Scotland Neck, N. C., to Concrete Steel Co.
300 tons, sewer in New York City, to Concrete Steel Co. General contractor, J. F. Cogan.
250 tons, power plant at Dayton, Ill., to Corrugated Bar Co.
250 tons, addition to plant of Miehle Printing Press Mfg. Co., Chicago, to Concrete Steel Co.
200 tons, Vose factory, Watertown, Mass., to Concrete Steel Co.
200 tons, Missouri river highway bridge at Lexington, Mo., to Corrugated Bar Co.
200 tons, Bourbon Stockyards Co., Louisville, Ky., to Kalman Steel Co.
200 tons, hotel building, Butte, Mont., Kalman Steel Co.
200 tons, school No. 69, Baltimore, to Hartmann, Duncan & Rogow, Inc.
162 tons, building for Endicott-Johnson Co., Endicott, N. Y., to Concrete Steel Co.
160 tons, warehouse for Los Angeles Soap Co., Los Angeles, to Gun, Carl & Co.
150 tons, department store at Asheville, N. C., to Corrugated Bar Co.
150 tons, foundation for Straus building, Jackson and Michigan boulevards, Chicago, to Corrugated Bar Co.
150 tons, 7-story apartment hotel, Kansas City, Mo., to Corrugated Bar Co.
150 tons, Walsh department store building, Davenport, Iowa ,to Corrugated Bar Co.
140 tons high school, at Beverly, Mass., to E. A. Tucker.
125 tons, freezer building for George A. Hormel & Co., Austin, Minn., to American System of Reinforcing.
125 tons, highway work in Lynn county, Iowa, to Concrete Seel Co.
110 tons, Masonic temple, Bakersville, Cal., to Edward L. Soule.
100 tons, power plant at Maquoketa, Iowa, to Corrugated Bar Co.
100 tons, Sieg warehouse, Davenport, Iowa, to Concrete Steel Co.
100 tons, highway work at Fond du Lac, Wis., to Concrete Steel Co.
100 tons, hotel Manchester, N. H., to Concrete Steel Co.
100 tons, apple storage building for the Morgan County Cold Storage Co., Berkeley Springs, W. Va., to the Concrete Steel Co., Pittsburgh.

CONTRACTS PENDING

1000 tons, hotel and theater, Tremont St., Boston; pending.
1000 tons, building at Dayton, O., bids asked.
700 tons, building for Mohawk Carpet Co., Amsterdam, N. Y.; bids asked.
500 tons, Aetna Insurance building, Hartford, Conn.; bids being taken.
400 tons, high school, at Hartford, Conn.; bids being taken.
300 tons, school building at Albany, N. Y.; bids asked.
300 tons, Peabody high school annex, Pittsburgh; P. H. Kelly Construction Co. low bidder; bars probably will be furnished by the Concrete Steel Co., Pittsburgh.
250 tons, Saverberg Lind building, Des Moines, Iowa; bids asked.
240 tons, Stanley factory, New Britain, Conn., to Bancroft & Martin.
200 tons, grandstand at Topeka, Kans.; bids asked.
175 tons, Illinois Central Railroad Co., Fulton, Ky., bids asked.
150 tons, Stony Creek bridge, Glen county, Cal.; bids being taken.
150 tons, Phoenix bank building, Hartford, Conn.; pending.
140 tons, high school, at Dorchester, Mass.; bids in.
100 tons, Missouri Pacific railroad at St. Louis. Bids asked.
100 tons, office building, Oakland, Cal; bids being taken.

Pipe Advances

$4 to $5 Announced by Leading Mills—Tonnages Are Declined

PIPE PRICES, PAGES 410 AND 468

Pittsburgh, Feb. 6.—With cards dated Feb. 1, leading independent pipe producers, including the Republic Iron & Steel Co., Youngstown Sheet & Tube Co., Mark Mfg. Co., and Jones & Laughlin Steel Corp., have inaugurated higher levels. The National Tube Co. duplicated the action Feb. 3.

On standard full weight pipe card discounts have been lowered two points, making the base on 1 to 3-inch, 64 off on black and 52½ off on galvanized. This constitutes an advance of $4 per ton although because the 2½ per cent preferential discount to jobbers has been eliminated, 1 and 5 off being quoted instead of 1, 5 and 2½ off, this advance amounts practically to in excess of $5 per ton. At the same time, oil country goods, line pipe, casing, drive pipe, etc., all have been increased $6 per ton. The Wheeling Steel Products Co. still maintains a price on black $2 per ton higher than independents with a base discount of 63 off

on black although on galvanized its base discount is the same, 52½ off. The Pittsburgh Steel Products Co. has advanced seamless cold-drawn and hot-rolled boiler tubes, 2 inches and larger, $6 per ton.

There is no letup in demand and offers of tonnage at the new cards have been exceedingly large the past two or three days. Buyers are encountering filled-up conditions on the part of the mills on every side, and lots of oil country goods consisting of 5000 or 6000 tons at a time have been declined by the Mark Mfg. Co., the Youngstown Sheet & Tube Co., and others. The Mark company has practically obligated its output for several months to come, and the Youngstown Sheet & Tube Co. with other producers in the valley and in the Pittsburgh district as well, cannot entertain any more business for the first quarter at least. The Sinclair interests are reported to have placed 200 miles of 8-inch and 10-inch line pipe with a middle western mill but the Ohio Fuel Supply Co. still is negotiating for 10 miles of 16-inch. The Philadelphia Co. has entered into an arrangement with a middle western producer for its requirements.

Municipal Tonnage Demand

New York, Feb. 6.—A lot of 3000 tons of 6 to 12-inch cast iron pipe has been placed by the city of Rochester, N. Y., with the Warren Pipe & Foundry Co. A lot of 3000 tons for Woonsocket, R. I., is expected to be closed shortly, and several other municipal projects are in sight. This, in conjunction with good private demand, continues to make for an exceptionally active market. Prices are strong at the advance of about $1 reported last week.

Southern Makers Are Busy

Birmingham, Ala., Feb. 5.—Despite the recent advance in prices, cast iron are busy. Shipments are heavy, both pressure and soil pipe movements exceeding anything that has been noted for more than two years.

The Hope Engineering Co. has entered the market for 100 miles of 8 and 10-inch line pipe for installation in Louisiana.

Seamless Tubes Raised

Pittsburgh, Feb. 6.—The Pittsburgh Steel Products Co. has just advanced seamless cold drawn and hot rolled boiler tubes, 2-inch and larger, $6 per ton. The last carload discounts on 1-inch, 51 off; 1¼ and 1½-inch, 43 off; and 1¾-inch, 27 off, are unchanged. The new list of carload discounts on 2-inch and larger compared with the old are as follows:

Seamless Cold Drawn

	New	Old
2 and 2¼ inch	27	30
2½ and 2¾ inch	31	34
3 inch	35	38
3¼ to 4 inch	40	43
4½ and 5 inch	32	35

Seamless Hot Rolled

	New	Old
3 inch	37	40
3¼ to 4 inch	42	45

No change is made in seamless mechanical tubing nor in seamless steel locomotive and superheater tubes. This new schedule follows that of the National Tube Co. of Jan. 23 on steel boiler tubes.

The Nonferrous Metals

Prices Highest in Several Years with Big Domestic Markets and Some Foreign Business

	Copper: Electro delivered	Copper: Lake delivered	Spot Straits New York	†Lead New York basis	Zinc St. Louis basis	Spot† aluminum	Spot antimony	Nickel spot
Jan. 31.....	15.00	15.00	40.00	8.20	7.15	23.00	7.12½	28.00
Feb. 1.....	15.00	15.12½	40.00	8.20	7.15	23.00	7.12½	28.00
Feb. 2.....	15.00	15.12½	39.87½	8.15	7.10	23.00	7.12½	28.00
Feb. 5.....	15.00	15.12½	40.00	8.15	7.05	23.00	7.12½	28.00
Feb. 6.....	15.00	15.12½	40.25	8.15	7.05	23.00	7.12½	28.00

†Outside market quotation.

NEW YORK, Feb. 6.—Metal prices have been strong in fairly active markets the past week. Copper, lead and tin have been selling at the highest levels since the autumn of 1920, while zinc recently experienced a quick recovery to 7c, East St. Louis. The Ruhr valley occupation has had no perceptible influence in the markets, as domestic consumption has been at a rate sufficiently high to keep producers busy. Some Spanish lead has been sold here which otherwise would have gone to Germany, but not enough to have a market effect. Germany has bought some good sized tonnages of copper despite the economic struggle now in progress. France, Great Britain and Italy also have been buying moderately of American copper.

Electrolytic copper prices advanced from 14.87½c to 15c, delivered, Jan. 29, and some agencies have taken spot business at 15.12½c, delivered. Both wire mills and brass mills have been doing a large business, January being one of the largest months on record in point of new copper wire bookings. Many large utility projects are going forward. Foundry activity keeps up and consumption of casting copper and composition ingot is heavy. Casting copper sold as high as 14.60c, refinery. Lake copper advanced to 15.12½c, delivered.

A little slab zinc has been sold for export recently and domestic brass mills and galvanizers have bought fair tonnages. Prime western advanced to 7.15c. East St. Louis by Jan. 30, then reacted to 7.05c. The increasing production has been the source of anxiety to some smelters, who have competed sharply for forward business, but labor is imposing a limitation on output.

Some large business has been done in lead in the outside market. Prices advanced as high as 8.15c, East St. Louis, which is above the actual New York market, disregarding the 35 cent freight rate from St. Louis to New York. This condition is due to the offering of Mexican and other foreign lead at New York for eastern delivery. Supplies continue tight.

Tin deliveries in January in the United States amounted to 6625 tons, one of the largest months on record. The world visible supplies increased slightly during the month, however, due to large Straits shipments. The United States Steel Corp. is reported to have made large shipments from the Straits in late January. Straits tin prices have ranged between 39.87½c and 40.50c the past week. Ninety-nine per cent grades have been about 1 cent under Straits.

The International Nickel Co. reduced its quotation for its electrolytic 99.80 per cent nickel from 39c to 32c recently and shot and ingot from 36c to 29c. Independent sellers have sold shot and ingot at from 26c to 30c. Nickel consumption has been gaining, but competition has been keen.

January sales of antimony were the largest of any month since the armistice, with prices strong for spot carlots of ordinary Chinese antimony 7.12½c, duty paid.

Aluminum importers have continued to quote 23c, New York, for 98 to 99 per cent virgin ingot and 24c, New York, for 99 per cent. The Aluminum Co. of America's quotations are unchanged at 24c and 25c, respectively. Business has been slow in the outside market, consumers being well covered for the first half of the year.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Copper, hot rolled 24 oz., min...	22.25
High brass	19.00
¼inc, ga. 9 to 18 (plates ½c less)	9.00 to 9.50
Lead, full sheets (cut ¼c more)	11.25
Aluminum, base 18 ga. and up...	36.40
SEAMLESS TUBES	
High brass	23.50
Copper	25.25
RODS	
High brass, round, ⅜ to 2½ inch	17.25
Naval brass rod	19.50
WIRE	
Copper	16.00 to 16.62½
High brass	20.00

Old Metals

Dealers' buying prices cents per pound

HEAVY RED BRASS	
Cleveland	10.00 to 10.50
New York	9.00 to 9.50
Chicago	10.25
HEAVY YELLOW BRASS	
New York	6.50 to 7.00
Chicago	8.25
Cleveland	7.00 to 7.50
ZINC	
New York	4.25 to 4.50
Cleveland	4.00 to 4.50
HEAVY COPPER AND WIRE	
Cleveland	12.25 to 12.75
New York	11.75 to 12.00
Chicago	12.50
RED BRASS TURNINGS	
New York	8.00 to 8.50
Cleveland	9.00 to 9.25
Chicago	9.00
YELLOW BRASS TUBING	
Cleveland	7.00 to 7.50
NO. 1 BRASS ROD TURNINGS	
Cleveland	7.00 to 7.50
New York	7.00
Chicago	7.75
ALUMINUM BORINGS	
Cleveland	11.00 to 12.00

Compares Costs, Profits at Basing Hearing

Chicago, Feb. 6.—Little progress has been made this week in presenting the case of the United States Steel Corp. in opposition to the complaint of the federal trade commission before that body. Since last Tuesday when A. B. Winter, statistician for the Illinois Steel Co., went on the stand to identify certain exhibits filed by that company, a recess has been in effect until this week. The time has been employed by counsel for the commission going through the exhibits and drawing off figures.

The exhibits consist principally of about 2000 original sales contracts made during 1908 to 1915, accompanied by tabulations. Attorneys for the commission are seeking to lay the foundation for an objection to their admission. The question of their admissability still is undecided by Commissioner Bennett.

An exhibit presented by the commission in closing its case was a tabulation of production costs and profits on various finished steel forms at principal producing centers, and the effect on these profits when freight from Pittsburgh was added. The accompanying table is a condensation of this table, which was prepared by H. E. White, statistician for the commission, from evidence of costs presented by steel companies earlier in the hearings.

PRODUCTION COSTS AND PROFITS COMPARED

	Cost of production per net ton	Price per net ton f.o.b. Pittsburgh	Freight per net ton from Pittsburgh	Delivered price per net ton	Profit per net ton
Bars					
Pittsburgh	$45.00	$47.00	$00.00	$47.00	$2.10
Chicago	40.80	47.00	7.60	54.60	13.80
Birmingham	44.00	47.00	*5.00	52.00	8.00
Duluth	50.40	47.00	13.20	60.20	9.80
Shapes					
Pittsburgh	46.60	49.00	00.00	49.00	2.40
Chicago	38.20	49.00	7.60	56.60	18.40
Birmingham	46.50	49.00	*5.00	54.00	7.50
Plates					
Pittsburgh	43.40	53.00	00.00	53.00	9.60
Chicago	42.80	53.00	7.60	60.60	17.80
Birmingham	50.90	53.00	*5.00	58.00	7.10
Black Sheets					
Chicago	69.50	87.00	7.60	94.60	25.10
Pittsburgh	76.70	87.00	00.00	87 00	10.30

Note (*) The delivered prices at Birmingham are obtained by adding an arbitrary differential of $5 per ton to the f.o.b. Pittsburgh prices. Were the actual freight of $15.30 per ton added to the f.o.b. Pittsburgh price as is done at Chicago, Birmingham profits as shown would be increased $10.30 per ton

New Blast Furnace To Be Built at Granite City

Confirmation is given by W. G. Maguire, executive vice president of the St. Louis Coke & Chemical Co., that an additional blast furnace will be built by that company at Granite City, Ill., during the next summer. No plans or details for the new furnace yet have been completed. The St. Louis Coke & Chemical Co. at the present time operates a single blast furnace stack at Granite City which it completed in 1920 and has a production of about 200,000 tons of pig iron annually. More recently it has completed a by-product coke plant of the Roberts oven type. A considerable portion of the ore now used is from Missouri deposits and a larger output is to be provided from the mines at Iron Mountain, Mo.

Carnegie Extensions at Youngstown in View

No official action in the way of making appropriations or a final executive consideration yet has taken place in connection with the plans for the extensive enlargement of the plants of the Carnegie Steel Co., Youngstown district, which are reported to be in view. According to reports at Youngstown, these plans call for the construction of two modern blast furnaces of large capacity and from 10 to 12 additional open-hearth furnaces at the Ohio works of the Carnegie company, Youngstown, and two or three additional bar mills at the plant of the McDonald plant of McDonald, O., nearby.

The Ohio works at present embraces six 500-ton blast furnaces; two bessemer converters; 15 open-hearth furnaces; 40 and 43-inch blooming; 23-inch billet and sheet bar and 15-inch billet mills. The McDonald plant which was built a few years ago contains five bar mills. It was originally planned for nine units.

The carrying out of these plans is contingent upon favorable action by the executive officials of the Steel corporation at New York to whom this matter has not yet been presented.

Judge Gary Sees Period of Expanding Trade

New York, Feb. 6.—Before leaving on a Mediterranean trip Wednesday E. H. Gary, chairman of the United States Steel Corp., has given out an interview in which he says business prospects are excellent and demand for iron and steel exceeds expectations. He believes the European situation will be settled without serious effect on conditions of this country. He states:

"Present demand for steel products in the United States and many foreign nations is remarkable. It exceeds the most sanguine expectations of a year ago. The ability to fully supply this demand is not sufficient and it is doubtful if it could be fully covered if the supply of labor were sufficient to keep production up to manufacturing capacity. The demand for domestic uses and export are equally good. Bookings on hand are unusually large, payments are prompt and prices firm, and if nothing unexpected happens there is no reason to suppose there will be a letup in our business for several months. We should proceed with courage and confidence. We have only to take advantage of our opportunities. Have we sense enough to do this, that is the question."

Prepare New Alien Bill

Washington, Feb. 6.—The house immigration committee is whipping into shape a bill it will introduce this session—but expects no action upon—reducing the number of permissible aliens from 3 to 2 per cent and to base quotas upon the 1890 census instead of 1910. The effect would be greatly to increase the quotas of northern and western European nations, which are not now sending over the maximum number, and reduce Italy's quota by one-half and Austria's by one-third.

Midvale Stockholders Act

In a latter from Chairman W. E. Corey of the Midvale Steel & Ordnance Co., it is announced that holders of more than a majority of the stock of the company has approved the sale of its property and that of the Cambria Steel Co., to the Bethlehem Steel Corp. At a meeting March 12, final approval will be given.

Trumbull Gain Large

Production of finished material of the Trumbull Steel Co. in 1922 was 383,746 tons compared with 136,711 tons in 1921, according to the statement of President Jonathan Warner to the stockholders at the annual meeting Feb. 6. Yearly sales were $22,163,726 as against $12,851,589 in 1921. Net operating profit was $1,912,000 against $260,384 in 1921.

Census Pig Iron Data Compared

Total Output of All Products, Including Ferroalloys, in 1921 Given as 16,618,493 Tons, Valued at $418,771,200—Production at 40 Per Cent of Capacity—Decrease from 1919 Shown, but General Increase Over 1914

WASHINGTON, Feb. 6.—Census bureau comparisons of pig iron production and the activity of blast furnaces reveal a marked decrease in 1921 from 1919 but in general a growth in 1921 over 1914. In wages paid, persons engaged, the cost of raw materials used and the value of products of blast furnaces the 1921 statistics are approximately half those of 1919. But excepting the number of companies and the number of employes, the industry in 1921 had taken substantial strides over 1914. The census bureau's detailed statement on the activity of what it calls iron blast furnaces is shown in the table at the bottom of this column.

There was considerable fluctuation in the monthly employment of wage earners in 1921. In January, the month of maximum employment, 30,818 wage earners were reported, and in August, the month of minimum employment, 13,913, the minimum representing 45.1 per cent of the maximum. The average number employed during the year was 18,968, as compared with 41,660 in 1919. The returns indicate that the combined output of all establishments was only about 40 per cent of the maximum capacity.

In the detailed comparison of production for 1921 and 1919 the census bureau includes ferromanganese, spiegeleisen and other ferroalloys in the 1921 statistics but not in the 1919 ones.

The total value of the output of pig iron and ferroalloys in 1921 is given as $418,771,200, compared with $801,062,300 in 1919. The figures show an average unit value, for all pig iron, including the ferroalloys, of $25.59 per gross ton in 1921; $26.33 in 1919; $13.44 in 1914; and $15.12 in 1909.

The producers consumed in their own works 76.8 per cent of the production in 1921, and 71 per cent in 1919. The production by coke constituted 99.3 per cent of the total in 1921, and 98.5 per cent in 1919.

Of the pig iron, considered by grades, basic constituted 45.1 per cent of the total; bessemer, 34.8 per cent; foundry, 15.9 and all other, 4.2 ferromanganese and spiegeleisen constituted 84.8 per cent of the blast furnace alloys in 1921; 82 per cent in 1919.

The comparison of production in gross tons follows:

	1921	1919
Pig iron and ferroalloys	16,618,493	‡30,543,167
For consumption in works of company producing	12,766,218	21,687,376
For sale	3,852,275	8,855,791
All other products	.....	.....
Pig iron and ferroalloys by fuel used:		
Coke	16,494,176	30,097,220
For consumption	12,749,605	21,686,861
For sale	3,744,571	8,410,359
Charcoal	315,737	315,737
Other fuel	30,550	130,210
Basic	7,411,403	14,597,535
Bessemer	5,723,361	9,374,950
Foundry	2,613,332	4,792,961
Malleable	330,875	1,090,344
Low phosphorus	201,731	289,726
Forge or mill	111,221	287,529
White, mottled and miscellaneous	25,637	56,418
Direct castings	18,817	53,704
Ferroalloys	182,116	†318,751
Ferromanganese	103,717	180,444
Spiegeleisen	50,750	81,010
Ferrosilicon	22,170	53,516
Ferrophosphorus	5,479	3,781
Delivered molten to steel works	8,884,764	18,138,453
Machine cast	5,773,618	7,746,656
Sand cast	1,781,902	3,970,309
Chill cast	159,392	634,045
Direct castings	18,817	53,704
Pig iron by grades	16,436,377	30,543,167

‡Ferroalloys made in blast furnaces in 1919 were not included in this industry.

†Blast furnace ferroalloys included in the ferroalloy industry (1919) and not included above.

Production Records

Broken in January—Trumbull-Cliffs Stack Claims World Record

With a production of 23,364 gross tons of pig iron during January, the new 600-ton blast furnace of the Trumbull-Cliffs Furnace Co., Warren, O., is believed to have established a world's record. Operating entirely on iron ore, the furnace averaged 753 tons of iron per day for the 31 days of January. During the last two weeks of the month, from Jan. 18 to 31, inclusive, the average daily output was 797 gross tons. The largest single day's tonnage was 921 tons. The average daily production, for the month, the average daily for two weeks and the production for a single day are all claimed to be the highest on record.

The iron, which was made for the Trumbull Steel Co., being charged in molten form into the open-hearth furnaces, was of the standard basic grade. Only Lake Superior iron ore was used, no scrap of any kind being charged. The coke was of the standard Connellsville grade and was furnished by W. J. Rainey, Inc., and the consumption was 1986 pounds of coke per ton of iron. Less than 1½ per cent of the iron had a sulphur content of over 0.05 per cent. The flue dust produced amounted to 143 pounds per ton of iron.

During January the Trumbull Steel Co., produced 38,000 gross tons of steel in its seven open-hearth furnaces, several of the furnaces having just been repaired. Most of the steel was of special analysis for the company's strip mills. Finishing mills turned out 38,000 tons during the month. This necessitated buying a considerable tonnage of semifinished steel. Shipments of finished products in January totaled 31,000 tons. The 9-inch strip mill rolled 315,000 pounds of strips in one 8-hour turn and established a record for this mill.

The blast furnace of the Trumbull-Cliffs Furnace Co. was built in 1920-21 and was first operated on Jan. 16, 1922. Freyn, Brassert & Co., Chicago, were the engineers during construction. The plant is owned jointly by the Trumbull Steel Co., and the Cleveland-Cliffs Iron Co. D. T. Croxton, of the latter company, is supervising operation of the stack while J. S. Fraser is works manager and in full charge of operations of the open-hearth plant.

Other valley plants also broke records for monthly output in January. Officials of Sharon Steel Hoop Co. announced that with the exception of their blast furnace at Lowellville all other departments broke previous monthly tonnage records. These departments included the open-hearth furnaces at Lowellville, the blooming and bar mills there, the sheet mills at Youngstown and the four strip mills at Sharon, Pa. The Struthers Furnace Co. announced that its stack

(*Concluded on Page 429*)

	1921	1919	1914
Number of establishments	134	195	160
Persons engaged	23,219	46,956	33,194
Proprietors and firm members	7	41	15
Salaried employes	4,244	5,255	3,823
Wage earners (average number)	18,968	41,660	29,356
Salaries and wages	$40,633,400	$87,204,400	$28,895,200
Salaries	11,263,700	13,435,000	6,114,600
Wages	29,369,700	73,769,400	22,780,600
Contract work	547,700	692,300	265,100
Cost of materials	361,049,500	621,286,500	264,580,000
Value of products	419,771,200	794,466,600	317,654,000
Value added by manufacture (1)	58,721,700	173,180,100	53,074,000

(1) Value of products less cost of materials.

January Iron Continues Gain

Production of 3,226,065 Gross Tons Surpasses December Output by Over 140,000 Tons—Blowing In of Eight Additional Furnaces Brings Active Total to 261 on Last Day of Month

OUTPUT of coke and anthracite pig iron for the fifth consecutive month continued to show increase in January. Total production of iron during the 31 days of January aggregated 3,226,065 gross tons and registered an increase of more than 140,000 tons over December. In spite of this increase, however, the January production as that of December still stands the largest since October, 1920, when 3,288,341 gross tons was made. Operations of blast furnaces during the month continued on the upgrade with the blowing in of eight additional stacks.

MONTHLY PRODUCTION

	1923	1922	1921
January	3,226,065	1,645,804	2,414,753
February	.....	1,630,180	1,929,394
March	.....	2,035,908	1,594,866
April	.....	2,070,161	1,190,751
May	.....	2,309,348	1,215,272
June	.....	2,362,455	1,064,007
Total 1st half.	3,226,065	12,053,856	9,409,043
July	.....	2,403,030	864,642
August	.....	1,810,655	954,901
September	.....	2,024,008	985,795
October	.....	2,629,655	1,234,450
November	.....	2,846,110	1,414,958
December	.....	3,083,520	1,642,775
Total 2nd half.	.....	14,796,988	7,097,521
Grand total..	3,226,065	26,850,844	16,506,564

Total production of pig iron during January amounted to 3,226,065 gross tons which, compared with the 3,083,520 tons of the preceding month, was an increase of 142,545 tons. On a daily basis the output of January was 104,066 tons per day and a 4598-ton gain over the 99,468-ton daily rate of December. The daily output of January was the first to pass the 100,000-ton mark in 27 months or since October, 1920, when the average daily production was at the rate of 106,075 tons per day. Compared with the low point of July, 1921, when the average daily production was 27,892 tons, the January rate represents an increase of 273 per cent.

Merchant pig iron produced in January totaled 712,436 tons. Compared with the 668,950 tons of December this was an increase of 43,486 tons. Reduced to an average daily basis, this production represented 22,981 tons per day as against 21,579 tons in December or a gain of 1402 tons per day. Nonmerchant or steelworks production during January was 2,513,629 tons, a gain of 99,059 tons over the 2,414,570-ton output of the month preceding. On an average daily basis,

AVERAGE DAILY PRODUCTION

	1923	1922	1921	1920	1919
Jan.	104,066	53,090	77,895	87,172	106,654
Feb.	.....	58,220	68,906	102,904	105,270
Mar.	.....	65,674	51,447	108,895	99,614
April	.....	69,005	39,691	91,754	82,479
May	.....	74,495	39,202	96,510	67,991
June	.....	78,748	35,466	101,533	70,467
July	.....	77,517	27,892	98,190	78,200
Aug.	.....	58,408	30,802	101,468	88,453
Sept.	.....	67,466	32,857	104,143	82,692
Oct.	.....	84,827	39,821	106,075	60,142
Nov.	.....	94,870	47,165	87,836	80,244
Dec.	.....	99,468	52,992	87,105	84,711
Ave.	104,066	73,563	45,223	99,456	83,910

the nonmerchant output was at the rate of 81,085 tons per day or 3196 tons better than the 77,889-ton daily rate of December.

Blast furnaces operating on Jan. 31 totaled 261 as compared with 253 on Dec. 31. This total of active stacks was the largest since October, 1920, when 290 were in production. During the month six merchant stacks were blown in and two blown out or banked, the net gain being four stacks. Of the nonmerchant class six stacks were blown in and two blown out, with a net gain of four stacks. The total net increase, therefore, was eight stacks.

Of the total number of furnaces operating on the last day of January, 77 were merchant and 184 nonmerchant. The corresponding figures for December were 73 merchant and 180 nonmerchant. On Jan. 31 the Steel corporation was operating 96 blast furnaces as compared with 94 on Dec. 31 and 86 on Nov. 30.

Spiegeleisen made during January totaled 12,056 tons and made a gain of 1456 tons over the 10,591 tons of December. Ferromanganese with 19,358 tons also showed an increase, being 2250 tons better than the 17,108 tons of the month before.

Furnaces blown in during the month were: In Ohio: one, La Belle, La Belle Iron Works; Hubbard No. 1, Youngstown Sheet & Tube Co.; one Bellaire, Carnegie Steel Co. In Pennsylvania: Swedeland No. 3, Alan Wood Iron & Steel Co.; Vesta, E. J. Lavino & Co.; Hokendauqua No. 3, Thomas Iron Co. In Alabama: Bessemer, No. 3 Tennessee Coal, Iron, & Railroad Co.; one Woodward, Woodward Iron Co. In Tennessee: Cranberry, Cranberry Furnace Co.; Ashland No. 2, American Rolling Mill Co.; one Norton, Norton Iron Works. In Illinois: Gary No. 2, Illinois Steel Co.

Among the stacks blown out were: In Ohio: Milton, Milton Iron Co. In West Virginia: Weirton, Weirton Steel Co. In Alabama: one Vanderbilt, Woodward Iron Co. In Illinois: Gary No. 1, Illinois Steel Co.

DIVISIONS OF PRODUCTION

1922	Merchant	Non-merchant	Spiegel	Ferromanganese	Other ferro
Jan.	388,322	1,257,482	1,230	5,644	825
Feb.	355,455	1,274,725	4,930	3,618	872
Mar.	390,643	1,645,265	2,095	11,604	1,102
Apl.	375,814	1,694,347	4,211	14,998	828
May	410,404	1,898,944	4,902	15,432	405
June	423,672	1,938,783	4,817	18,254	854
July	441,752	1,961,278	7,176	18,871	1,887
Aug.	343,522	1,467,143	7,925	11,402	976
Sept.	353,604	1,670,404	4,235	10,681	934
Oct.	502,231	2,127,424	12,285	9,193	1,080
Nov.	603,348	2,242,762	4,192	13,232	961
Dec.	668,950	2,414,570	10,591	17,108	989
Tot'l	5,257,717	21,593,127	68,589	150,039	11,713
1923 Jan.	712,436	2,513,629	12,056	19,358	952

JANUARY PIG IRON

	No. of stacks	Number in blast last day of month: January	December	—Total tonnage made— Merchant	Nonmerchant	—Totals— January	December
Pennsylvania	159	94	91	144,979	999,093	1,144,072	1,107,014
Ohio	80	60	58	167,733	649,371	817,104	788,591
Alabama	43	25	24	127,551	105,222	232,773	221,401
Virginia	19	4	4	21,224	.....	21,224	21,067
New York	26	15	15	75,449	107,202	182,651	171,303
New Jersey	4	1	1	14,076	.....	14,076	14,953
Illinois	26	18	18	68,354	224,301	292,655	281,569
Colorado	5	3	3				
Indiana	16	14	14	29,368	301,419	330,787	304,466
Maryland	6	5	5				
Wisconsin	6	3	3				
Kentucky	7	3	1				
West Virginia	5	2	3	22,721	48,591	71,312	62,561
Tennessee	14	7	6				
Washington	1	..	..				
Georgia	2	..	..				
Texas	1	..	..				
Minnesota	3	3	3	32,183	54,862	87,045	81,907
Michigan	4	4	4				
Missouri	1	..	..				
Spiegel and ferro—all states	..	..	..	8,798	23,568	32,366	28,688
Totals	428	261	253	712,436	2,513,629	3,226,065	3,083,520

Why France Needs German Coke

With the Demands of Lorraine To Care For, France Is Producing Less Coal Than Before the War—Figures Show Germany Not Short of Fuel —What France Expects from the Ruhr

BY VINCENT DELPORT
French Correspondent of Iron Trade Review

PARIS, Jan. 26.—The French iron and steel industry is passing through a critical period owing to the shortage of fuel which has been particularly acute since November and aggravated since the occupation of the Ruhr. The production of mills and furnaces has been increasing since the beginning of last year, but this progress is checked at present, and now that stocks of coke are depleted, the effects are felt, not only on production costs which have been rising of late, but on production itself. Toward the middle of January an inquiry came to France from a large American company for 500 tons of pig iron, and several French furnaces were obliged to decline the business for they had no more stocks available. They refused to quote, even on short delivery terms owing to the uncertainty.

In 1913 the consumption of fuel in France exceeded production by 23,000,000 tons; the surplus came from England, Belgium and Germany. In the new situation created by the war, and if the French mines had not been devastated, practically the same tonnage would have to come from outside sources. But 50 per cent of the French coal mines have been destroyed, and not only has the reparations commission reduced the tonnage which Germany was to deliver in compensation for the loss, but the actual German deliveries always have been below the tonnage thus fixed.

The peace treaty formally stipulates that the Saar mines are to be given over to France in compensation of the damage caused to her own mines, providing the requirements of the Saar consumers are covered; these requirements amount to about 45 per cent of the production in the Saar district. It is also stipulated that Germany should deliver 7,000,000 tons of coal annually during 10 years, plus the difference between the annual prewar production of the French coal mines in the Nord and Pas-de-Calais and the annual production dating from the cessation of hostilities. This difference in 1921 amounted to 13,000,000 tons, thus making a total of 20,000,000 tons of coal due to France from Germany in 1921. Germany only delivered about 11,000,000 tons, which amount is considerably lower than that which was actually fixed by the reparations commission.

A Comparison of Coal Consumption

Consumption in 1913 taken as 100

In	1921 Per cent	1922 Per cent
Germany	90	106
Great Britain	62	77
France	66	77
Belgium	75	91

Considering more specially the coke question, owing to its direct relation to iron and steel production, the situation is particularly critical. In 1913 France produced 4,000,000 tons of coke and consumed 7,000,000 tons; most of the production, 3,000,000 tons came from the northern district where numerous coke ovens were destroyed. In 1922, France could only produce 3,700,000 tons of coke and her requirements reached 11,500,000 tons, of which 4,500,000 tons is consumed by Lorraine which produces little coke.

In 1913 the coke required by all the territories now belonging to France came from the following sources: From France, 4,000,000 tons; from Lorraine, 150,000 tons; from the Saar, 150,000 tons; from Belgium, 1,000,000 tons; and from Germany, 6,200,000 tons. Of this last figure, Germany furnished only about two-thirds or 4,300,000 tons in 1922, while her production has reached practically the same figure as in 1913.

It is interesting to note the comparative situation of France and Germany in 1913 and during the years 1921 and 1922, as regards coke, especially with reference to the Lorraine district and those regions neighboring Luxemburg. German statistics and figures issued by the reparations commission point out that leaving out Upper Silesia, the Saar district, Lorraine and Luxemburg, Germany, within her present borders produced 28,200,000 metric tons of coke in 1913, while her production during the first nine months of 1922 inside the same boundaries reached about 25,300,000 tons; thus in 1922 her production practically equalled that of 1913. In 1913, 31 per cent of the total or nearly 9,000,000 tons was exported to Lorraine and Luxemburg furnaces, and 54 per cent or about 15,200,000 tons was used for domestic requirements. In 1921, only 16 per cent of the production of German cokeries was delivered to Lorraine and Luxemburg and 80 per cent was consumed by German furnaces. During the first nine months of 1922, Lorraine and Luxemburg received 21 per cent and Germany consumed 74 per cent of the coke made in Germany. Thus during 1922 Germany will have consumed about 20,000,000 tons of coke for her domestic requirements, as compared to 15,000,000 tons in 1913. This tends to prove that German industries are active.

On the other hand the situation of the French iron and steel industries can be reviewed as follows: France's requirements in coke exceed prewar figures by 4,500,000 tons while her present production is below 1913 output; moreover, Lorraine and Luxemburg receipts from Germany are only two-thirds of 1913 figures. Belgian coke is practically unobtainable and English coke can only be brought to France at high prices at present exchange rates. Also it arrives in poor condition.

It seems evident that the principal cause of France's shortage in coke is due to Germany's failure to deliver the full quantities fixed by the reparations.

Before the War and Today

A Comparison of German Fuel Production and Consumption

Coal

	——Metric Tons—— 1913	1921
German coal output in present boundaries	140,000,000	136,200,000
German coal consumption in present boundaries	130,000,000	111,000,000
German coal and lignite consumption in present boundaries	155,000,000	139,000,000

Coke

German coke output in present boundaries	28,200,000	*25,300,000
German coke consumption in present boundaries	15,200,000	20,000,000
German coke exports to Lorraine and Luxemburg	9,000,000	4,300,000

*First 11 months of 1922.
Lignite is figured at 2/9 of its weight in coal.

	1913	1922

Ruhr Iron Output Is Improved

Surplus of Coal Accumulates in District as French Embargoes Prevent Shipments Into Germany, and Rail Strike Blocks Movement to France — French Furnaces Suspending Operations—Prices Continue Upward

Iron Trade Review Staff Cable

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Feb. 5.—Production of pig iron in the Ruhr, which slumped 30 per cent when the French took possession, is slightly improved. Output of steel also is larger, resulting from abundant local fuel supplies. The French embargo is curtailing shipments to the unoccupied portion of Germany while the rail strike continues to hamper deliveries to France and Belgium, hence the Ruhr itself has a surplus. The output of the coal in the Ruhr is estimated at 180,000 tons daily compared with 300,000 tons before the occupation.

The fuel stringency in France is more severe than in Germany, while not over six German furnaces have been stopped. The following French furnaces have been blown out: De'Wendel, at Hayange and Moyeuvres, 6; Lachiers at Longwy, 2; Burbach at Luxemburg, 5. The following have been banked: at Knutange, 2; Thionville, 2; Laprovidence at Rehon, 2; Acieries D'Longwy, 1.

Sterling—$4.68

German reports show that only 76,000 tons of coal were shipped to France and Belgium in the first 12 days of occupation. The price of furnace coke has been advanced in France to 150 francs ($9.19), delivered, delivery after Feb. 15.

European prices generally continue to advance especially in Great Britain where the scarcity of pig iron is growing as a result of heavy orders and restricted output. Ten stacks have been relighted recently and others are following. Further pig iron sales to America including a cargo of Scotch iron have been made at £6, c.i.f. Boston ($28). Freights are higher at 13 shillings 6 pence ($3.16) full terms, no concessions being made.

Another Scotch steelworks has restarted. American orders for tin plate have been placed with Welsh mills at £1, f.o.b. ($4.68). Further details are unavailable.

In the British market billets and sheet bars have been advanced 5 shillings ($1.17) to £7 15s ($36.27). Steel bars in the home market are 10 shillings ($2.34) higher and are quoted £10 5s ($47.97), and for export the price has been advanced to £9 5s ($43.29). Black sheets are quoted at £12 ($56.16) and galvanized sheets are £18 15s ($40.95). Rails for home use are 10 shillings higher ($2.34), or £8 15s ($40.95) and the same advance applies to those for export which are quoted at £8 ($37.44). Pig iron prices are stronger. No. 3 Middlesbrough foundry iron is 5 shillings higher ($1.17) or £5 5s ($24.57). Slight advances also are noted in prices of coke.

More Sales of Pig Iron to America Anticipated

European Staff Special

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.,

BIRMINGHAM, England, Jan. 25.—Conditions in the iron and steel trade appear to be fairly satisfactory with a general tendency to expansion. Recent price advances have been maintained. In some cases they have been accompanied by increases in the costs of production, especially for pig iron.

Coke is selling in the Yorkshire district at £1 3s 6d ($5.45) to £1 5s ($5.80), ovens. For Midland smelters this offsets entirely the slight advance obtained in selling prices. The Northampton and Derbyshire brands are from 1 shilling ($0.23) to 2 shillings ($0.46) higher. In the Middlesbrough area, coke is costing the high price of 31 shillings ($7.19) delivered from Durham at the furnaces. This has compelled the makers there to put up their price for No. 3 G. M. B. to £4 13s ($21.57) with an extra shilling ($0.23) for export. East Coast mixed numbers have been advanced to £4 14s ($21.70). In addition to the high price of coke, ores have become firmer, rubio ore now being £1 3s ($5.33) per ton c. i. f.

The disturbances in Germany have checked continental buying to some extent, and although the United States is inquiring, the new business which appears to be pending has not matured. Prices are cut rather fine and well-known Derbyshire furnaces have rejected offers of American business because the terms were not quite good enough. There is every prospect of a large spring business in pig iron with America in the spring, now that prices in the United States are stiffening.

Sterling—$4.64

A few small furnaces have been started in the Glasgow district and some at Middlesbrough and Barrow are being made ready. A large Derbyshire concern has added an additional furnace. The very large foreign business in fuel is far from being an advantage to the iron trade, and we have learned from rather bitter experience in the last year or two that flashes of prosperity arising from continental or other misfortunes have to be paid for later, generally with interest.

The immediate effect of the continental trouble has been to disable France and Belgium as international competitors while Germany also seems to be out of consideration. Hardly any quotations are coming from the continent. It is reported here, on what appears to be good authority, that the steel works have been warned by French military authorities to hold their men in readiness for reserve military service. The steel works are not cultivating business with this country, and British consumers of semifinished steel are turning their attention to British steel works. Various contracts have been placed for steel billets, with the result that prices have advanced to a minimum of £7 15s ($35.96). Some firms with very good order books are demanding £8 ($37.12), and in certain cases £8 5s ($38.28) is quoted. In the South Wales area the steelmakers, who recently put up their sheet and tin bars to £7 13s 9d ($35.67), are now quoting £8 ($37.35) per ton, subject to the usual rebate of 7 shillings 6 pence ($1.74). Finished steel prices are maintaining their recent advance, and the West of England has now followed the other districts in applying the 5 shilling ($1.16) rise to rails, light material and constructional steel generally. Activity is not noticeable in constructional steel, but the railways are placing more business, and the Sheffield works specializing on tires and axles, as well as the builders of rolling stock in the Birmingham district now have full order books. There are strong complaints of lack of profits. An example of this is cited in Sheffield where an order for rolling stock was taken on the basis of £130 ($603.20) per wagon for the same kind of vehicle sold during the boom for £500 ($2320). The very low price quoted for rolling stock is a matter of general remark.

In the Barrow district the mills are

Current Iron and Steel Prices of Europe

Converted into Dollars at Rates of Exchange, Feb. 5

British Market

Home Market Prices. Gross Tons at Works or Furnace

Corrected to Date by Cable

	$	£ s d
SEMIFINISHED STEEL		
Billets, soft steel	36.27	7 15 0
Sheet bars	36.27	7 15 0
Wire rods	47 97	10 5 0
FINISHED STEEL		
Steel bars, England, ¾ to 3-inch	47.97	10 5 0
Steel bars, England, ¾ to 3-inch, for export	43.29	9 5 0
Plates, ship, bridge and tank, England	42.12	9 0 0
Plates, ship, bridge and tank, England, for export	39.78	8 10 0
Plates, ship, bridge and tank, Scotland	40.95	8 15 0
Plates, ship, bridge and tank, Scotland, for export	38.03	8 2 6
Beams, England	40.95	8 15 0
Beams, England, for export	38.61	8 5 0
Beams, Scotland	40.95	8 15 0
Beams, Scotland, for export	38.61	8 5 0
Sheets, black, 24 gage	56.16	12 0 0
Sheets, galvanized, 24 gage	87.75	18 15 0
Rails, 60 pounds and over	40.95	8 15 0
Rails, 60 pounds and over, for export	37.44	8 0 0
Tin plate, base box, 108 pounds	4.97	1 1 3
Steel hoops	53.82	11 10 0
Steel hoops, for export	51.48	11 0 0
PIG IRON		
Hematite, East Coast, Mixed Numbers	23.40	5 0 0
Hematite, West Coast, Mixed Numbers	23.99	5 2 6
Basic, Middlesbrough	21.06	4 10 0
No. 3 Foundry, Middlesbrough	24.57	5 5 0
No. 3 Foundry, Derby, Leicester, Nottingham	21.65	4 12 6
No. 3 Foundry, Northamptonshire	21.06	4 10 0
No. 3 Foundry, Staffordshire	21.06	4 10 0
No. 3 Foundry, Scotch	23.99	5 2 6
Ferromanganese, 76 to 80 per cent	70.20	15 0 0
Ferromanganese, 76 to 80 per cent, for export	65.52	14 0 0
COKE		
Yorkshire furnace	5.73	1 4 6
Yorkshire foundry	6.79	1 9 0

Where no separate export prices are given, same quotations apply to domestic and foreign business.

German Market

Prices Last Reported

	$	Marks per metric ton
PIG IRON		
Hematite, Oberhausen	4.72	196,700
Foundry, No. 3, Oberhausen	9.19	383,000
Bessemer Stahleisen, Siegen	5.54	230,700
Foundry, No. 1, Oberhausen	4.67	194,500
Luxemburg Foundry	4.43	184,500
COKE		
Ruhr furnace	1.33	55,590
Ruhr foundry	1.39	57,869
SEMIFINISHED STEEL		
Billets	5.49	228,700
Sheet bars	6.62	275,700
Wire rods	6.45	268,600
FINISHED STEEL		
Standard rails	7.44	309,800
Merchant bars	7.51	313,000
Structural shapes	8.14	339,300
Ship plates	8.47	353,000
Medium plates, 3 to 5 millimeters	9.54	397,500
Sheets, below 3 millimeters	11.53	480,500
Tin plate	20.69	862,000
Plain wire	8.94	372,300
Bands and strips	8.21	342,100

All prices are f.o.b. furnace or mill.

French Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Hematite, Lorraine	20.54	335
Basic bessemer, Lorraine	16.24	265
Foundry, Longwy, No. 3, sand-cast	15.63	255
Foundry, Longwy, No. 3, chill-cast	16.24	265
Ferromanganese, 76 to 80 per cent	68.66	1,120
COKE		
French furnace	5.95	97
German furnace f.o.b. frontier	5.95	97
French foundry	7.91	129
SEMIFINISHED STEEL		
Blooms	23.60	385
Billets	26.67	435
Sheet bars	....	445
FINISHED STEEL		
Standard rails	33.72	550
Merchant bars	30.96	505
Angles	29.12	475
Normal beams and profiles	29.12	475
Plates, ship and tank, 10 millimeters and thicker	31.57	515
Plates, bridge and tank, 5 to 10 millimeters	32.80	535
Sheets, black, 3 millimeters	35.25	575
Sheets, blue annealed, 2 millimeters	38.62	630
Shafting, cold-drawn, 40 to 60 millimeters	38.62	630
Bars, 2 per cent nickel steel	88.89	1,450

All prices are f.o.b. furnace or works.

Belgian Market

Prices Last Reported

	$	Francs per metric ton (2205 lbs.)
PIG IRON		
Basic bessemer, Belgian	16.11	295
Basic open-hearth, Belgian	16.11	295
Gray forge, Belgian	15.74	270
Foundry, No. 3, Belgian	16.65	305
Foundry, No. 3, Luxemburg	16.38	300
Foundry, No. 3, Lorraine	16.93	310
SEMIFINISHED STEEL		
Blooms	21.02	385
Billets	22.66	415
Sheet bars	23.48	430
Wire rods	33.03	605
FINISHED MATERIAL		
Standard rails	25.49	485
Merchant bars	25.39	465
Normal beams and profiles	24.02	440
Plates, 5 millimeters and thicker	27.30	500
Sheets, black, 3 millimeters	28.94	530
Sheets, galvanized, 1 millimeter	85.72	1,570
Plain wire	43.68	800
Galvanized wire	54.60	1,000
Wire nails	31.67	580

All prices are f.o.b. furnace or works.

busier than for some time. The staple product at the moment appears to be rails, both at Barrow and the neighboring area of Workington. That district is getting busier on shipbuilding and engineering work. Similar reports are being received from Glasgow where a number of mills are operating at full capacity for the first time in many months. Middlesbrough steel mills have become really active, with a steady flow of specifications from shipbuilding yards, and expanding foreign business.

Demand for steel scrap has expanded enormously, one of the features of the quarterly trade meeting at Birmingham being a certain amount of excited buying by merchants and consumers who are concerned over the prevailing scarcity. One buyer invested heavily in scrap at £4 10s ($20.88) per ton, although this was 5 shillings ($1.16) above the recognized figure. The Welsh steel works now have hardly any scrap to offer, and the consumption by siemens furnaces has so greatly increased that it is anticipated difficulties will soon arise for lack of scrap.

The Staffordshire iron mills are more active, but the price situation is unusual. Lancashire and Yorkshire have found no difficulty in putting up their prices for bar iron 10 shillings ($2.32) per ton, making the new standard £11 10s ($53.36). Against this Staffordshire found it almost impossible to obtain the nominal £11 ($51.04), although it seems to be generally conceded that the Staffordshire brand is superior to the Lancashire. Sales of Staffordshire iron have been made this week as low as £10 10s ($48.72) per ton. There are fair inquiries in that area for hoops, and the signs are that good orders for cotton ties will be forthcoming when the shipping season commences.

The shipping revival has stimulated the nut and bolt trade in the Darlaston area. Belgium is ready to ship No. 3 bars at £8 2s 6d ($37.70), delivered, but this severe competition has not prevented the Lancashire makers from putting up their prices by something like 2 shillings 6 pence ($0.58) to £10 ($46.40) per ton.

The sheet trade is gradually improving. Scotland has been able to get some of its largest sheet mills going regularly for home and export, in some cases after long periods of idleness. The South Wales trades are also becoming more active. The recent rise in galvanized sheets of £1 ($4.64), making the selling price £18 10s ($85.84), checked business somewhat. But the mills have not reacted, and this is still the recognized figure, now

adopted by the largest steel works.

The price of tin plate has advanced a little, partly as the result of an increase in the standard figure for tin bars. The steelmakers have followed up their advance at the beginning of the year, when the base rate became £7 13s 9d ($35.67), by a further rise to £8 1s ($37.35), now the recognized figure. For the present the rebate of 7 shillings 6 pence ($1.74) continues. This is part of a plan adopted some months ago for the stabilizing of semifinished steel and tin plate. The system was adopted for six months and is due shortly for reconsideration. It is generally considered to have worked well, and is almost certain of renewal.

The makers of tin plate have advanced their prices to cover the additional cost of material, and most makers now demand £1 1s ($4.87) per box. The minimum, however, is £1 0s 6d ($4.75).

Coke Situation in France Now Critical

European Staff Special

Office of IRON TRADE REVIEW,
224 Rue de Rivoli,

PARIS, Jan. 26.—The occupation of the Ruhr is absorbing the attention of French iron and steel producers. The event has a direct influence on the market. Any criticism on the action of the French government is kept back, but great anxiety is felt since the first effect of the occupation was the refusal by Germany to deliver any more fuel. As French furnaces in the East and Lorraine depend entirely on Ruhr coke the situation is critical, especially since stocks were very scarce owing to Germany's previous systematic policy of delivering only part of the allotments fixed by the reparations committee, thus furnishing an insufficient tonnage. Although vigorous measures have been taken by the Franco-Belgian mission which has started requisitions of coal and coke, it is expected that iron and steel production in France will be reduced for some time, especially as the needs of Luxemburg and Belgium also must be provided. To keep furnaces going coke is being bought at a high price from England and Holland and small quantities are obtained from Belgium.

Franc—$0.065

A call for co-operation is being issued in France to all concerns possessing a certain stock of coke, that all available coke may be fairly distributed.

For the present, new transactions are exceedingly scarce in the iron and steel market and no commitments are made on extended deliveries. Until recently, many mills took orders at adjustable prices based on the price of coke at the time of manufacture, but in view of the uncertainty regarding coke, even this plan has ceased to be adopted. In the meantime, the prices of semifinished steel and certain finished products are constantly rising. The limited output of pig iron is easily absorbed. The price for No. 3 foundry pig iron has reached 270 francs ($17.50) per metric ton. Orders have been obtained from Belgium, Italy and England, at about the same price f.o.b. Antwerp. The Société Horme & Buire has blown in a 120-ton furnace and has lighted a large battery of coke ovens. The Aciéries de France are ready to blow in a new stack as soon as a sufficient stock of coke will be available. This furnace will produce hematite pig iron from Spanish ore. Hematite prices are rising and range from 335 francs ($21.75) to 400 francs ($26), according to regions.

Steel prices are being adjusted upward. Many mills which are booked for a certain period refuse to quote on new business. Lorraine billets have reached the price of 440 francs ($28.55) f.o.b. mill. England has passed a number of orders, but Germany has dropped out. Merchant bars are quoted 505 francs ($32.75), hoops and bands 615 francs ($39.95). The price of plates and sheets has somewhat decreased.

In the wire products department, prices are firm and business active. Wire rods are quoted 560 francs ($36.35) to 570 francs ($37.) f.o.b. eastern mill. The base price for galvanized wire averages 1130 francs ($73.45) per metric ton.

In the tube department, 70,000 meters of cast iron pipe have been sold to Brazil by the Société Anonyme Metallurgique d'Aubrives & Villerupt and by the Fonderies de Pont-a-Mousson.

Canadian Structural Demand Is Heavy

Foreign Special Service

TORONTO, Ont., Feb. 6.—Business in the Canadian pig iron market is confined almost entirely to small tonnages for spot delivery. Foundries are making some progress and some melters may be forced to increase their first quarter orders. The smaller foundries are furnishing the bulk of the present demand. In the Montreal district melters are being supplied with foreign brands of iron, but none of this is now appearing in the Ontario market. Prices remain firm, with No. 1 (2.25 to 2.75 silicon) and malleable quoted at $33.55; No. 2, (1.75 to 2.25 silicon), $32.55 per ton, Toronto. Montreal prices are No. 1 and malleable, $35.90; No. 2, $34.90; Summerlee and Carron, imported, $33 to $35.

In the finished iron and steel market business continues to show steady improvement. Building activities are making headway and during the past week or two several large contracts for structural steel and bars were placed. The Dominion Bridge Co. has the contract for steel for the new building for the Toronto transportation commission, involving 2000 tons of structural steel and 700 tons of reinforcing bars. The same company has taken 800 tons of structural steel for the new Redford building, Toronto. The addition to the store of the T. Eaton Co., Toronto, will require 1700 tons, to be supplied by McGregor & McIntyre, Toronto. The Canadian Bridge Co., Walkerville, Ont., has taken 2000 tons for the new Ford building on Danforth avenue, Toronto; also 3500 tons for the new Ford plant at Walkerville, Ont. Contracts for steel for several other proposed large buildings are pending, including a central building for the Bell Telephone Co. of Canada, Toronto, for which some 2000 tons will be required. It is stated that the Robert Simpson Co., Toronto, will build an addition requiring 700 tons.

Local mill representatives report a stronger demand for bars. A large volume of business is coming out. Bars now are 2.60c, Toronto. Structural shapes and reinforcing bars are in brisk demand, with mills quoting 2.40c, Toronto.

A number of orders calling for large tonnages of plates were booked during the week. Plates continue firm at 2.30c, Toronto. A slight improvement is reported in the demand for black and galvanized sheets. No. 28 black sheets are quoted at 4.25c, and No. 28 galvanized 5.25c, Toronto.

The demand for iron and steel scrap is becoming stronger, but actual business has not yet reached the volume expected by local dealers. Steel plants are buying heavy melting steel and turnings for spot delivery. Dealers are offering $11 per gross ton, Hamilton, Ont., for heavy melting steel and $9 per gross ton for turnings. Boiler plate is being purchased by dealers at $9 per gross ton, Toronto, and iron and steel axles at $16 per gross ton, Toronto. Toronto dealers continue to offer $18 for machinery cast, $10 for malleable scrap and $14 for stove plate and standard car wheels in net tons, delivered, Toronto.

Draft New Specifications for Structural Steel

According to an announcement made by the American Institute of Steel Construction, of which L. H. Miller, 1052 Leader-News building, Cleveland, is managing director, a committee has been organized to recommend unit stress, column formulas, and a specification for structural steel. The committee consists of the following architects and engineers:

Prof. George F. Swain, consulting engineer and professor of engineering, Harvard university.

Prof. Milo S. Ketchum, dean of the college of engineering, University of Illinois, and author of text books on structural steel design.

E. R. Graham, of the architectural firm of Graham, Anderson, Probst & White, Chicago.

W. J. Thomas, chief engineer of the architectural firm of Geo. B. Post & Sons, New York.

Wilbur J. Watson, president, Watson Engineering Co., Cleveland.

At a meeting of this committee which was held Jan. 15 and 16, 1923, a draft was made of a tentative specification covering the design, manufacture, and erection of structural steel for buildings. The individual members of the committee now are making a separate study of this specification to assure themselves that the entire field has been properly covered in such a way as to assure its acceptance by all the interests concerned in the results of the work.

Scrap Exhibits Strength

(*Concluded from Page* 416)

of New England foundries, the scrap iron and steel market entered February decidedly strong. Machinery cast has sold at $23.50 delivered in several round tonnage lots during the last few days. Malleable scrap has figured prominently in recent trading. A Boston foundry is in the market for about 600 tons for delivery over a period of three months. The Laconia Car Co., Laconia, N. H., is also bidding for a large amount of malleable scrap. It is understood this latter company has been quoted a minimum of $23 delivered which is high because of the heavy freight rate to the nearest point where this grade of scrap is in storage. Nearly 1000 tons of heavy melting steel is reported sold for delivery to Pittsburgh at $16.50 shipping point.

Market Tone Easier

Buffalo, Feb. 6.—The market for scrap is easier since works have completed most of their purchasing for three months to come. Should dealers be able to make normal and regular deliveries steelworks would be congested. Buyers believe the peak has been reached and are not anxious to take on more tonnage. Dealers have frequently bid and paid more than the market for material, particularly borings. Under the surface the market is weaker. Some heavy purchasing has been done in the past three weeks. Railroad lists closed strong the fore part of last week, valley points having paid $24 for steel.

Local Buying Limited

Cincinnati, Feb. 6.—While demand for scrap here is light the activity in outside markets has strengthened the local situation to some extent. Local consumers are manifesting little interest in the trade and what business is booked comes from foreign sources. All items display exceptional firmness, notwithtsanding a lack of sizable orders. Advances on a majority of the items noticed during the past week, range from 50 cents to $1. Dealers say scrap consumption indicates steel mills in this locality are not operating on an average of more than 50 per cent of capacity. The car shortage and embargoes now are interfering with shipments. January values of business did not meet with the expectations of the trade. Part of the Big Four railroad list was disposed of here last week and is reported to have been closed at a fancy price. As a rule the railroads are not releasing scrap as freely as had been expected. Stocks in the hands of dealers are by no means large and any kind of a real buying movement would undoubtedly result in a shortage of materials.

Demand Continues Active

St. Louis, Feb. 5.—Demand for all grades of scrap iron and steel continues active, with prices tending upward. Steel works material is particularly strong, heavy melting having been marked up to $19. The activity at stove foundries is reflected in an urgent demand for cast grades, which are scarce and higher than at any time in more than 12 months. During the past two weeks users in Chicago and further East have been placing inquiries here for scrap for different sorts and sellers are more disposed than ever to hold on to material.

Market Tone Is Soft

Philadelphia, Feb. 6.—The tone of the local scrap market continues soft due to the lack of business. The belief is growing that this is but temporary, however, and indicative of the correctness of this belief, is the fact the Pennsylvania railroad list was closed at materially higher prices than eastern consumers would pay, the bulk of tonnage going to the West. However, the market here is practically untested by large buying, and it is believed materially higher prices than those now existing would have to be paid for large lots.

Both Grades Move Upward

Pittsburgh, Feb. 6.—While melters in the Pittsburgh district are not buying scrap in large quantities recent sales have involved from 50 to 5000 tons at a time. Practically all grades are higher by 50 cents to $1.50 per ton. For instance, while heavy melting steel has been sold as high as $24.50 and $25, sizable tonnages have brought $23.50 to $24. Above that has been paid by a Brackenridge, Pa., consumer on 3000 to 4000 tons. Dealers in Youngstown are paying $24 there. Machine shop turnings have brought $19 in this district; railroad steel specialties, $26.50; low phosphorus punchings as much as $27.50; heavy breakable cast, higher than $23; compressed sheets, $22; cast iron borings, $20.50; No. 1 wrought, $22.50 and in fact, up to $24 has been paid for 400 tons of A No. 1 material; sheet bar crop ends, $22.50; rails for rolling, $25 or more; shovel turnings, $19.50; iron car wheels, $25; axle turnings, $21.50, and stove plate, $18.

Prices Are Advanced

San Francisco, Feb. 2.—Melting steel prices have advanced during the past week and approximately 10,000 tons have been contracted for by local mills at a price around $14 delivered mill. Classifications such as steel rails No. 1 and steel rails miscellaneous are bringing higher prices than those for heavy melting steel. Cast iron scrap is holding around $26 to $27 a ton, but the movement is not heavy.

Production Records

(*Concluded from Page* 423)

in January broke its previous monthly high run. The Farrell blast furnaces of the Carnegie Steel Co. made more iron in January than in any other month of their history, the previous high mark being made in 1906. The eight sheet mills of the Falcon Steel Co. established a new monthly record when they turned out 7341 tons of sheets during the month.

In the Birmingham district new production records were made at plants of the Tennessee Coal, Iron & Railroad Co. in January. The six blast furnaces at Ensley produced 85,007 gross tons of basic pig iron as against 81,180 tons in December, the No. 1 furnace alone making 16,393 tons. The previous high record of this stack was 15,881 tons in May, 1922. The open-hearth furnaces at Ensley produced 102,613 tons of steel as compared with 99,005 tons in May, 1922, former high. The blooming mill of the steel plant at Ensley turned out 79,657 tons as against 75,592 tons in May, 1922. The rail mill produced 48,550 tons as against 46,541 tons in April, 1913. The bar mill at Bessemer turned out 4919 tons as compared with 4438 tons in October, 1922, and the guide mill 3189 tons, as against 3008 tons in March, 1920.

According to the Ford Motor Co., blast furnace Henry at the River Rouge works broke all previous tonnage and coke records for high silicon iron during January. This furnace produced an average tonnage of 514 tons per day with a coke consumption of 2015 pounds per ton of iron. The iron had an average silicon content of 3.46 per cent. Scrap and borings charged into the furnace averaged 12 per cent.

Farm Buying Exhibits Increase

Sales of Implements and of Mail Order Goods Making Sharp Gains—The Purchasing Power Highest Since 1919—Still Below 1913 Level—Gross Value of Crops Larger Than Prewar Year

BY JOHN. W. HILL, FINANCIAL EDITOR

RECENT reports of rapidly growing sales by implement makers and mail order houses in the agricultural sections are significant in showing the improved position of the farmer. As depicted by the business trend chart the purchasing power of farm products in December was at the highest point for that month since 1919. It has been rising since last summer, but it is still far below the 1913 level.

Much has been heard during the last two years respecting the theory that general revival would be impossible so long as farm prices remained out of line with those of other commodities. With a given quantity of farm products commanding only 68 per cent as much of manufactured goods as they did in 1913, it is evident the restoration of the old value relationship has not gone far.

This fact does not necessarily shatter the belief that farmer buying is essential to general good times. In the first place the index of farm prices does not reflect the greatly increased volume and value of this year's agricultural production compared with both 1921 and with prewar years. The value of 1922 crops was fully $2,000,000,000 or 35 per cent more than in 1921, and about the same increase over 1913. That meant a greatly enhanced aggregate income for producers.

Meanwhile the farm population is almost stationary. Total population of the country gained 39 per cent between 1900 and 1920, while farm population gained only 8 per cent. In the 10 years between 1910 and 1920 the number of farmers increased but 1 per cent against a general increase of 15 per cent. Thus the per capita income of the farmer shows an improvement over 1913.

Moreover certain agricultural products show a vast improvement in purchasing power over prewar. This is true of cotton and wool. Meats and grains are less fortunately placed. In the case of grains, expansion in production compensates for the failure of increases in unit values to keep pace with the rise of manufactured goods. Last year 25 per cent more wheat was raised than the average for 1910-13, while corn gained 8 per cent.

Prosperity of the farmer is important, but it is less so than it was in former years. In the early days of the nineteenth century tillers of the soil made up over 80 per cent of the population. In 1890 they comprised 56 per cent of the total. In 1910 this ratio had shrunk to 45 per cent and in 1920 it was only 40 per cent. It is estimated that the farmer income is not greater than 17 per cent of the country's total instead of the 50 per cent as is sometimes said.

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The Barometer of Business

WEEKLY COMPARISON

	Last week	Week before	One month ago	One year ago	1913
Business failures	437	511	396	629	450
Cash ratio Fed. Res. system	76.9	76.4	71.1	76.2	.....
Loan rate, 4-6 months, N.Y. (per cent)	4½-4¾	4½-4¾	4½-4¾	4¾-5	3½-3¾
Aver. 20 Ind'l shares	$93.81	$93.23	$94.24	$79.39	$83.50
Aver. 20 rail shares	$86.36	$86.23	$85.68	$75.74	$114.75
Av. 40 bonds	$78.85	$78.43	$79.36	$76.74	$93.00
Car loadings (week ended Jan. 20)	865,578	873,251	834,591	731,109	*804,866
Bank debits 221 cities (000 omit'd)	$9,205,213	$9,404,984	$11,223,963	$8,289,410	.....

*1930.

FOREIGN EXCHANGE (Demand)

	Normal	(close) Feb. 5	Week before	Month ago	Yr. ago
Sterling	$4.86	$4.67½	$4.63⅛	$4.64	$4.32¼
Francs	19.3c	6.42c	6.12½c	6.91c	8.37c
Lira	19.3c	4.85¼c	4.74½c	5.05c	4.68c
Marks	23.8c	0.0024c	0.0025c	0.014c	0.50c

MONTHLY COMPARISION

	December	Month before	Year ago	Monthly average 1913
Dodge building awards in 27 states	$215,213,000	$248,366,000	$198,218,000	$71,450,000
Business failures:				
Number	1814	1737	2444	1336
Liabilities	$58,069,021	$40,265,297	$87,502,382	$22,723,000
Exports	$344,000,000	$380,056,000	$296,198,000	$207,000,000
Excess of gold imports	$23,730,086	$3,274,561	$29,504,245	*$630,716
Bureau of Labor Price Index	156	156	140	100
Bradstreet's Price Index	148.2	149.1	123	100
Economist's British Price Index	‡4324	4264	4284	2717
Cost of Living Index	158.9	158.4	162.7	100.0
New incorporations	‡$909,693,800	$813,901,000	$843,000,000	$172,301,000
Railroad net earnings	†$78,860,000	$85,000,000	$65,884,000	$59,900,000

†November. ‡January. *Monthly average export excess.

The Business Trend

February 8, 1923

TRADE TODAY, TOLD BY IRON TRADE REVIEW CHARTS

GENERAL SITUATION—Trend of domestic trade continues definitely forward; Chairman Gary of United States Steel Corp. forecasts rising steel prices in line with upturn of general commodities; demand expected to hold; labor shortage hurts mill operations.

STEEL EARNINGS—Rapidly advancing costs caused another deficit for Steel corporation in 1922; wage increase added $4,000,000 monthly to payroll; earnings better now.

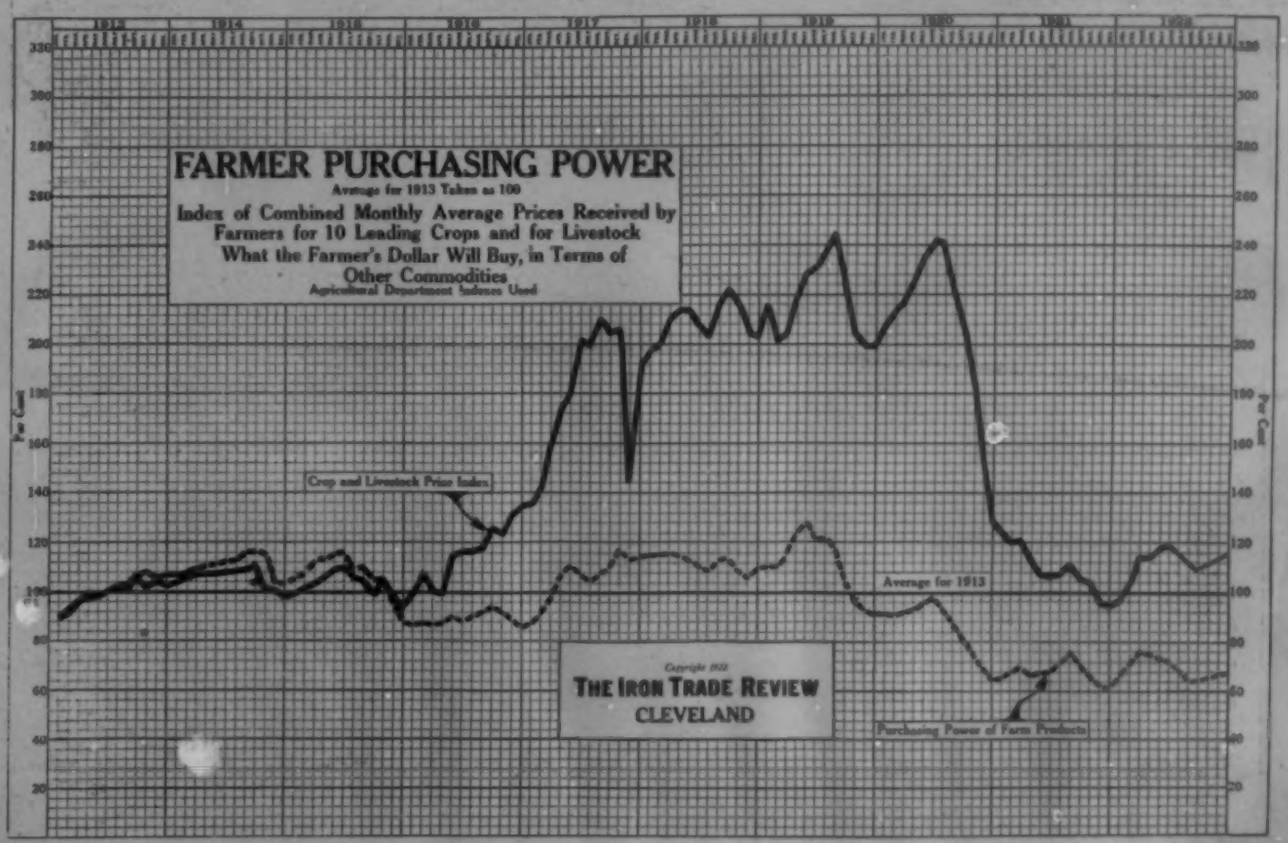
FARMER PURCHASING POWER—Index of buying power for farm products was 68 per cent of 1913 in December; highest for any December since 1919; sales to farmers growing.

STEEL EXPORTS—December foreign shipments of iron and steel of 154,087 tons highest since July; total was 18 per cent over December 1921; year's total below 1921.

COPPER—Price of copper crosses 15 cents a pound and reaches highest level in three years; low stocks and heavy domestic demand stimulate price; exports somewhat less.

IMMIGRATION—Hope fades for modification of immigration restrictions by congress; labor scarcity becomes more acute; 32,000 more alien laborers left country last year than entered.

FREIGHT TRAFFIC—January car loadings largest for month on record; exceed 1922 by 23 per cent; car shortage increases slightly, but only fourth as large as last fall.


FARMER PURCHASING POWER
Average for 1913 Taken as 100
Index of Combined Monthly Average Prices Received by Farmers for 10 Leading Crops and for Livestock
What the Farmer's Dollar Will Buy, in Terms of Other Commodities
Agricultural Department Indexes Used
Crop and Livestock Price Index
Average for 1913
Purchasing Power of Farm Products
Per Cent
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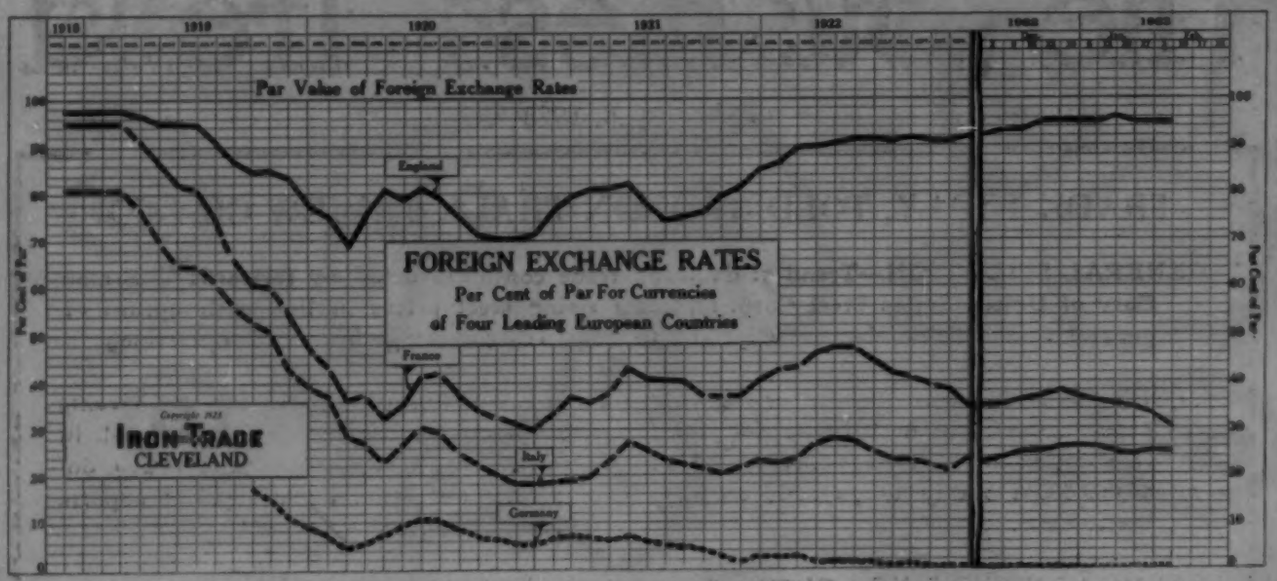
THE IRON TRADE REVIEW
CLEVELAND


Par Value of Foreign Exchange Rates
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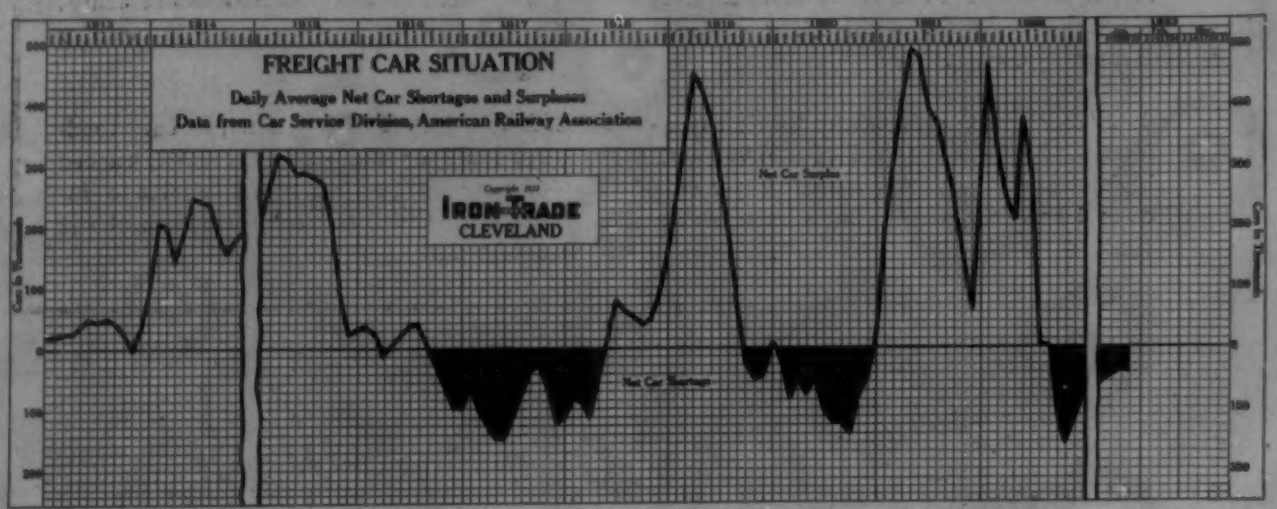
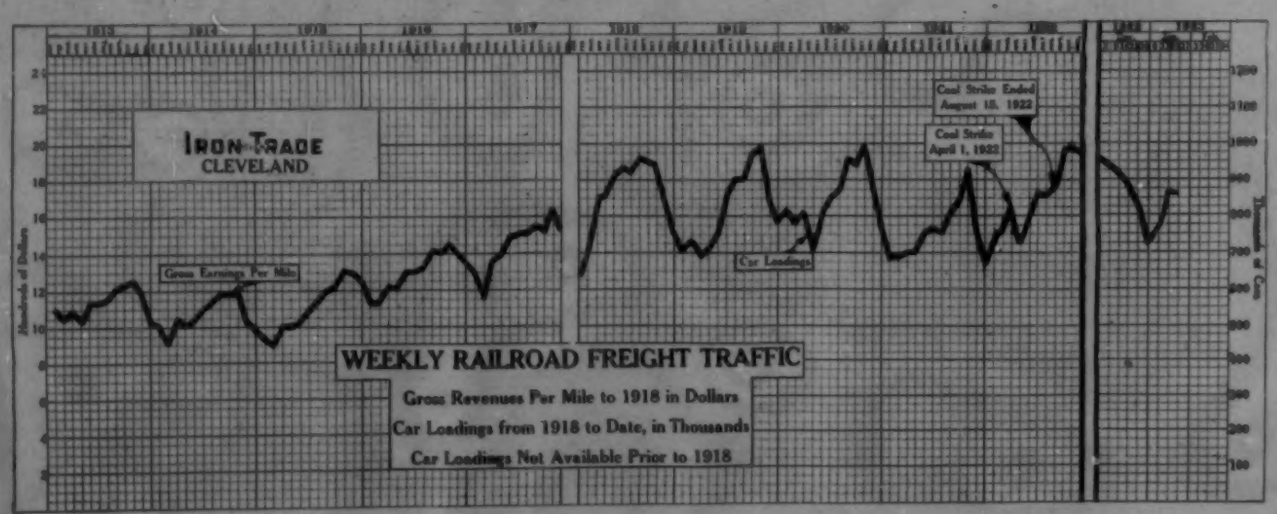
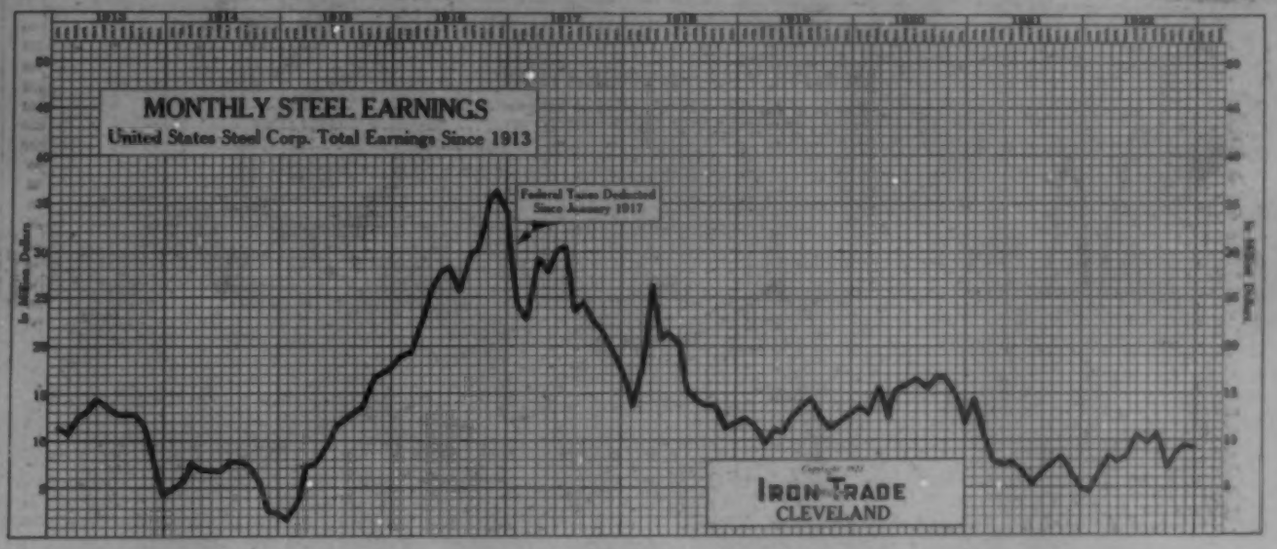
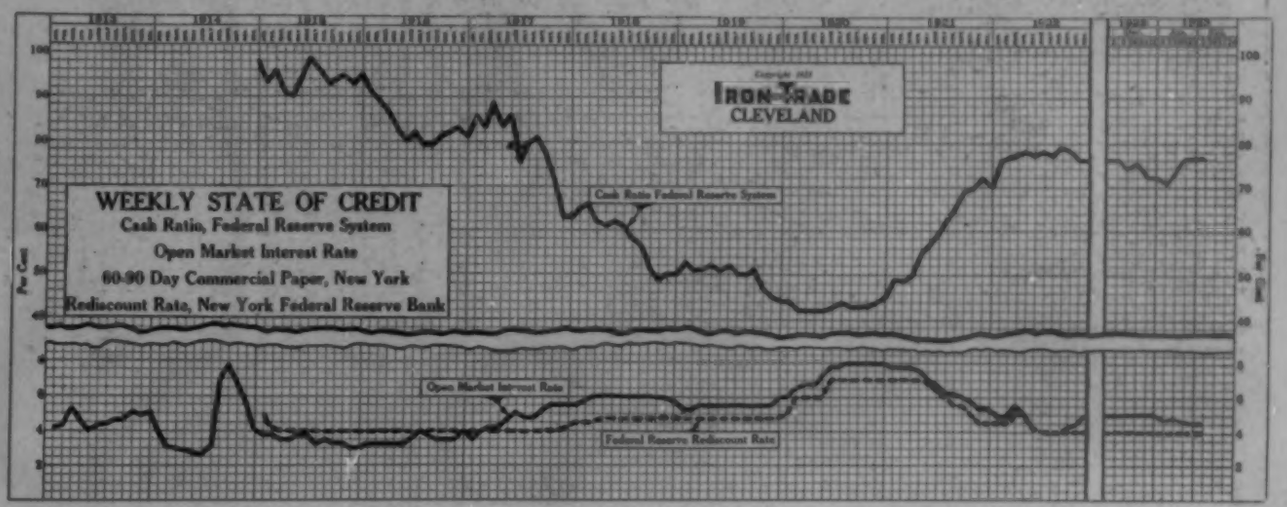
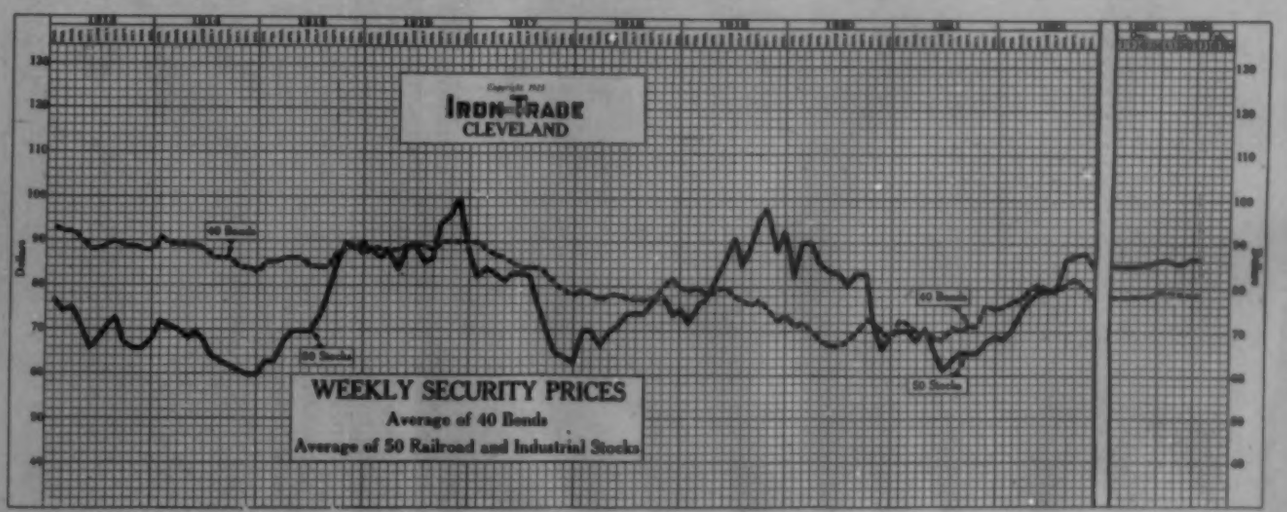
Per Cent of Par For Currencies
of Four Leading European Countries
IRON TRADE
CLEVELAND


FREIGHT CAR SITUATION
Daily Average Net Car Shortages and Surpluses
Data from Car Service Division, American Railway Association
IRON TRADE
CLEVELAND
Net Car Surplus
Net Car Shortage


IRON TRADE
CLEVELAND
Gross Earnings Per Mile
Car Loadings
Coal Strike Ended
August 15, 1922
Coal Strike
April 1, 1922
WEEKLY RAILROAD FREIGHT TRAFFIC
Gross Revenues Per Mile to 1918 in Dollars
Car Loadings from 1918 to Date, in Thousands
Car Loadings Not Available Prior to 1918


MONTHLY STEEL EARNINGS
United States Steel Corp. Total Earnings Since 1913
Federal Taxes Deducted Since January 1917
IRON TRADE
CLEVELAND


IRON TRADE
CLEVELAND
WEEKLY STATE OF CREDIT
Cash Ratio, Federal Reserve System
Open Market Interest Rate
60-90 Day Commercial Paper, New York
Rediscount Rate, New York Federal Reserve Bank
Cash Ratio Federal Reserve System
Open Market Interest Rate
Federal Reserve Rediscount Rate


IRON TRADE
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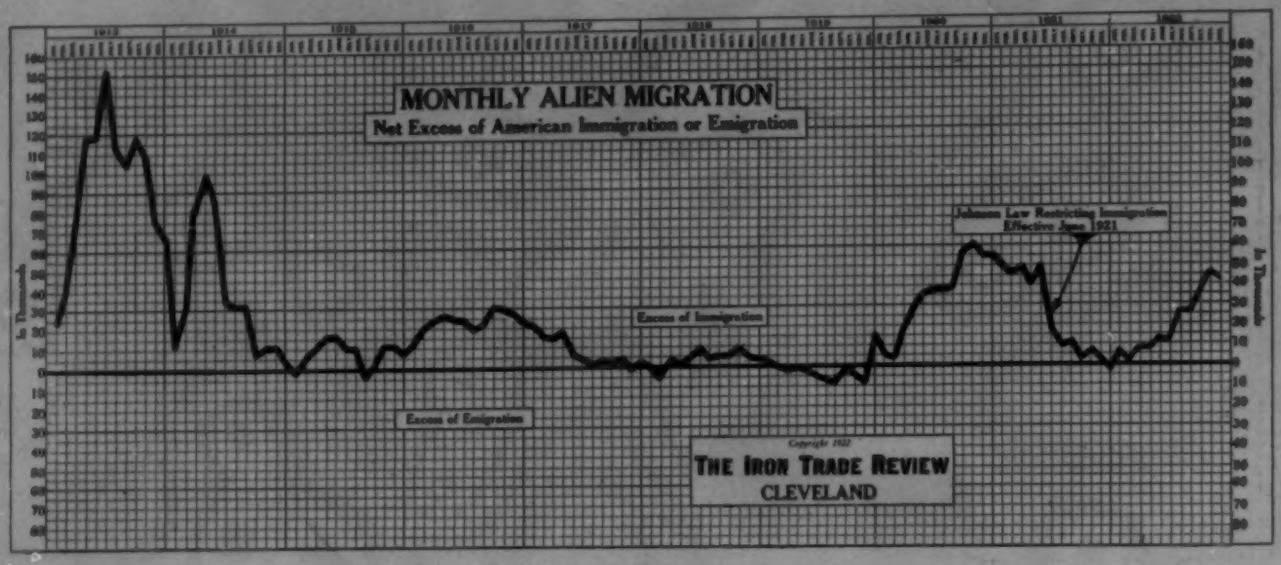
40 Bonds
50 Stocks
WEEKLY SECURITY PRICES
Average of 40 Bonds
Average of 50 Railroad and Industrial Stocks


MONTHLY ALIEN MIGRATION
Net Excess of American Immigration or Emigration
Johnson Law Restricting Immigration Effective June 1921
Excess of Immigration
Excess of Emigration
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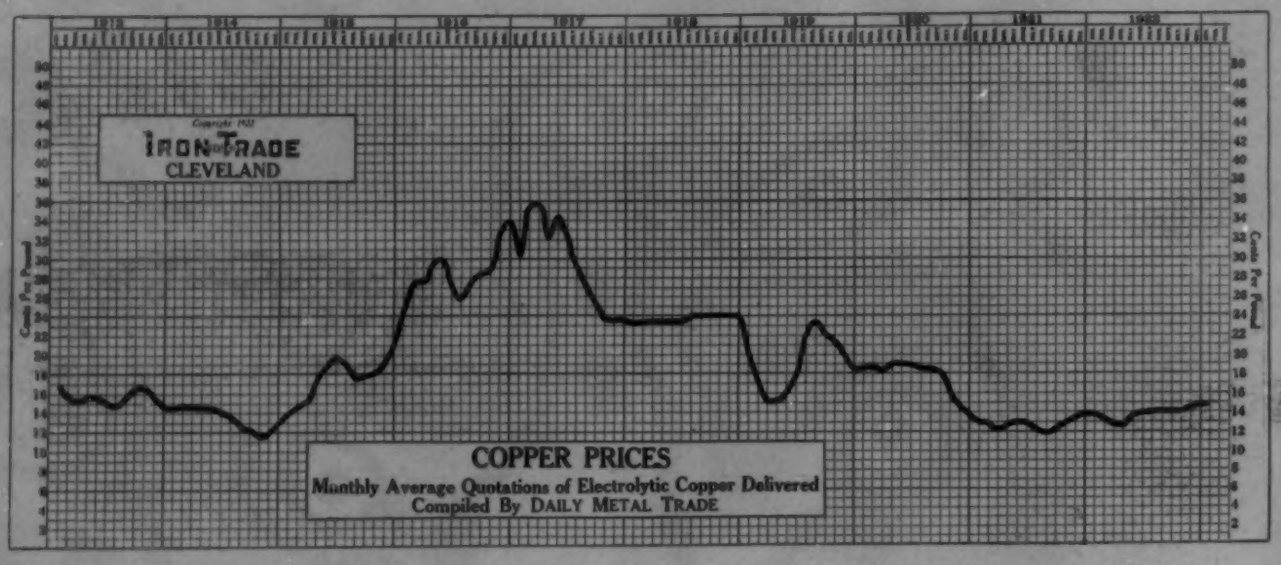
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COPPER PRICES
Monthly Average Quotations of Electrolytic Copper Delivered
Compiled By DAILY METAL TRADE

IRON AND STEEL FOREIGN TRADE
Monthly Exports and Imports of United States, Gross Tons
Tabulated by The Iron Trade Review
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Exports
Imports
Exports
Imports

West Favors Electrical Methods

Survey of Conditions on the Pacific Coast Shows Possibilities for the Commercial Success of Undertakings in Iron and Steel Production Using the Electric Furnace.—Costs of Labor and Materials Given

BY LARRY J. BARTON

TEN years ago there were only two electric furnace installations to the writer's knowledge, on the Pacific coast. They were those of the Warman Steel Co., and the Noble Electric Steel Co. The Warman company had an old type Stassano furnace, working on basic bottom, making steel castings at Redondo Beach, near Los Angeles. After much difficulty this installation was made a success, but later was scrapped when the company moved to Los Angeles. The installation at the Noble Electric Steel Co. was used in the manufacture of electrically smelted pig iron, but was never much of a success from a commercial standpoint, the location at Heroult being too far from both the market and the source of auxiliary materials, although iron ore and limestone were found in abundance on the property.

Carried on Experimental Work

During the following five years, or up to the beginning of the war in 1917, the growth was rather slow, although different experimental work was being carried on in several sections. With the entrance of this country into the war the growth became rapid, and installations could not be put up fast enough. Several small Greene furnaces were placed in operation around Seattle; the Warman company started two Heroult furnaces in Los Angeles; several smaller companies in the same district began operations on light casting work; the Pacific and the Enterprise foundries started up in San Francisco. The old Noble Electric Steel Co. took up a new lease of life and started the smelting of ferromanganese, ferrochrome, and ferrosilicon, and made exceptional progress in these lines. With the stimulus of war time orders the growth of small electric furnace shops was rapid, furnace manufacturers being unable to supply the demand for equipment.

One of the greatest troubles at this time was the inadequate supply of power, many shops being able to run only at night. The power companies were quick to realize this difficulty, and began rapidly to increase their power facilities. This expansion is now being completed, giving this section of the country a vast amount of power at fairly cheap rates. At the present time about 40 electric furnace installations are in operation on the Pacific coast and it becomes a matter of great importance to look toward the future.

This examination should cover the following points:-

The present and future market for electric furnace products such as plain carbon steel castings; alloy steel castings; manganese steel castings; gray-iron castings; white-iron castings; carbon and alloy steel ingots; tool steels; ferroalloys and electric smelted pig iron.

Availability of raw materials for such products, including steel scrap, iron ore, limestone, fluorspar, sand, refractories, electrodes, ferroalloys, manganese and chromium ores, and coke.

Present and future supply of power.

Present competition in the different lines.

Labor supply, both technical and unskilled.

Costs of operation.

The present market on the coast for plain steel castings is rather large, and due to the increase of manufacturing, will gradually become greater. The main demand comes from railroad work, ship building and repairs, oil field operations, tractor and automobile manufacture, and general manufacturing. The decrease of shipbuilding activity has cut rather heavily into this product, especially in the larger work for stern posts, rudder frames, etc., but this has more than been made up by increased general activity. At the present time, and for some time to come, the market will not be large enough to warrant further competition.

The present market for alloy steel castings is small, some chrome steel being used in mining and oil field work, with a small tonnage of nickel steel being in demand for miscellaneous uses. However, this line of work offers one of the greatest fields for the future. Heat treated alloy steel castings can compete with forgings, a great amount of which are used in the oil fields as fish tail bits, cutters, under reamer bodies, etc. Then there is the field of reciprocating parts in the railroad, tractor, and machine building industries, where the trend of parts is toward lighter weight and section.

The yearly tonnage of manganese steel castings on the Pacific coast will run close to 5000 tons. This is taken by the dredging industry for buckets, pins, runners, etc.; by the mines for crusher parts, wearing plates, and liners; by the tractor industry for treads, sprockets, etc.; and by the general manufacturing industry for such items as bucket teeth, gears, pinions, sheaves, and oil well rotary bits. The mines now are gradually increasing their operations, and the market is gradually becoming larger. A large amount of work goes to Alaska for use in the mines there, and a small export trade has been established.

Competes with the Cupola

Gray-iron castings offer a large field. All of the castings now made in the cupola could be made in the electric furnace if the cost of melting was low enough. Many lines where quality enters into the question, such as high pressure fittings, pistons and piston rings, etc., are now being made in the electric furnace. At present white-iron castings are not made to any great extent on the Pacific coast.

All of the present supply of ferroalloys comes from eastern points and due to the high freight rates, prices of the metal are excessive. With a consumption much greater than could be supplied by a small battery of furnaces, and with the present supply of cheap power, an attractive proposition is open for a company to start the manufacture of such alloys.

Scrap metal is being used much faster than it is being supplied, and it is only a question of time when pig iron will come into its own on the Pacific coast. This has been foreseen and the result has been several mergers of prominent open-hearth shops with the ultimate idea of importing Utah pig iron. This can be made much cheaper than electric smelted iron, unless this metal is used in the mol-

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Table I

Hydroelectric Projects Under Construction

Company	Location	Kilowatts capacity
Bridge River Power Co.	Vancouver, B. C.	20,000
British Columbia Electric railway	Vancouver, B. C.	35,400
City of Seattle	Newhalem Plant	2,200
City of Seattle	Gorge Creek	180,000
City of Seattle	Ruby Creek	270,000
Washington Water Power Co.	Spokane, Wash.	10,000
Idaho Power Co.	Twin Falls	11,100
City of Tacoma	Lake Cushman	56,000
Utah Power & Light Co.	Salt Lake City	5,500
Northwestern Electric Co.	White Salmon River	6,000
Portland Railway & Power Co.	Portland	20,000
Pacific Gas & Electric Co.	Stanislaus River	7,000
Pacific Gas & Electric Co.	Bear River	12,000
Pacific Gas & Electric Co.	Hat Creek, No. 1	10,000
Pacific Gas & Electric Co.	Hat Creek, No. 2	10,000
Pacific Gas & Electric Co.	Pitt River, No. 1	63,000
Pacific Gas & Electric Co.	Pitt River, No. 2	20,000
Great Western Power Co.	Caribou	120,000
City of San Francisco	Mocassin Creek	150,000
Turlock & Modesto Dcts.	Tuolumne River	70,000
San Joaquin Light & Power Co.	Kings River	108,500
San Joaquin Light & Power Co.	Kern Canyon	18,000
Southern California Edison Co.	Kern River, No. 5	32,000
Southern California Edison Co.	Big Creek, No. 8	135,000
Southern California Edison Co.	Big Creek, No. 3	150,000
Sepse Light & Power Co.	Ventura county, Cal.	28,500
City of Los Angeles	Franklin Canyon	5,000
Southern Sierras Power Co.	Mill Creek	3,350
Southern Sierras Power Co.	Leevining Creek	13,500

ten condition. Several direct processes are in operation on the coast, which may become commercial as the price of scrap rises. With pig iron at a price of over $35 a ton it becomes a commercial possibility to manufacture synthetic pig iron from steel borings, if certain technical difficulties, such as hard iron, can be successfully eliminated.

About the only special product being made on the coast is high silicon iron castings for acid resisting uses, in the different chemical and sugar industries. This is being made by one company which has control of the market, but the market is small when tonnage is considered.

Due to open-hearth operations the supply of steel scrap is less than the demand, especially in the heavy melting classes. However, large amounts are available of borings, turnings, and small miscellaneous scrap suitable for electric furnace work but which would be oxidized in the open-hearth process. Several of the larger open-hearth companies are now experimenting on methods of electro-smelting with the idea of producing pig iron when the supply of scrap becomes too low for consistent operations.

Iron Ore Deposits Found

Large deposits of iron ore have been found in California. Due to the lack of coking coal these deposits have hardly been touched. The largest of the deposits are found in Shasta, Madera, Placer, Riverside and San Bernardino counties, and are being exploited at the rate of about 2000 tons per year. The majority of these iron deposits are of high quality, and much experimentation has been done on different methods of reduction. Cheaper power, or the use of petroleum as a reducing agent, would mean great advances in the steel industry in this section.

The supply of high grade limestone is practically unlimited, many deposits occurring with iron ore. This is especially true of the Shasta county deposits. Deposits of fluorspar are found in Riverside, Mono, Los Angeles, and San Bernardino counties, but the actual production has been small. Several extensive deposits have been reported containing over 90 per cent calcium fluoride.

Sand suitable for molding purposes is found, especially in the Monterey district, where beach sand of excellent quality can be obtained of many different sizes. While this sand is suitable for general work it is not refractory enough for all castings, sand from Illinois at present being extensively used, especially for heavy steel work. Iron molding sands occur in abundance in almost every locality.

Practically all refractories at present come from eastern makers. Several firms make magnesite and silica brick, but their output is not sufficient to meet the demand. Developments are now being made to increase the capacity of several of the more promicent of these companies, with the result that in a short time a brick industry will be built up in this section of the country. Large deposits of high grade magnesite and dolomite are found on the Pacific coast.

The entire supply of electrodes comes from eastern points. Having suitable material and large amounts of available power, it is only a matter of time until electrode manufacture will take its place with the other industries in California.

Since the plant of the Noble Electric Steel Co., in Shasta county discontinued operations ferroalloys have not been produced. Several installations were started during the war but with the drop in the demand were unable to meet eastern competition. This industry offers an attractive field for capital at the present time.

Deposits of manganese and chrome ores of high quality occur widely in many counties, but production has been limited. Most of the deposits occur in large pockets, making the mining cheap. The market for this material is small at present. Lack of coke has been the greatest obstruction to the steel industry in the West. Developments are now being carried on to open the extensive coal deposits of Utah, which will mean great advances in the iron and steel trade. Railroads are being put in to tap these fields, and several blast furnace installations are being contemplated. Many extensive deposits of coal in both Utah and Washington are at present inaccessible due to lack of transportation facilities.

Construction Under Way

The extent of the growth of hydroelectric developments is shown by the list of recent undertakings given in Table I. Practically all of this construction is now under way, and is in addition to the present large supply. These projects will be completed at intervals during the next few years. Besides many thousands of acres of available water power land owned both by the different cities and private firms offer a vast potential field should the need arise.

A list of electric furnace shops on the coast, with ratings, and notes of operations is given in Table II.

At present lack of high grade technical men exists on the Pacific coast in the different metallurgical industries. The result of this has been that many shops have broken in their own furnace men with different degrees of success. Common labor is plentiful, although of doubtful worth. In the southern part of the state the Mexican predominates, while further north the Austrian, Italian, and Slav are more numerous. Due to the ease of existence on the Pacific coast the laboring class, as a rule, are not highly dependable, and tend to drift from place to place. The great ex-

ception is the one who stays and fits into a position of some importance such as gang boss, first helper, etc.

In general, operating costs in this section of the country, are comparable to those obtained elsewhere, but vary depending on the location of the plant. The following costs are some actually obtained in practice:

Shop A—Power 1c per kilowatt hour; scrap $16 per net ton; 6-ton furnace; basic operation, working two slags. This shop is operating on ingots and steel castings, 24-hour operation, 6 days per week. Cost of molten metal in ladle cover over one year period $32.

Shop B—Power 0.85 cents per kilowatt hour; scrap iron borings at $7 per ton and steel borings and turnings at $6; 1½-ton furnace, basic operation, one slag method. This shop pours three heats per day, 6 days per week, working on small sized iron castings; cost of gray iron in ladle $26.50, and white iron in ladle $29.

Basic Furnace Operation

Shop C—Power 1.4 cents per kilowatt hour; scrap borings for white iron at $7, and standard melting steel for other work at $16 per ton; 1-ton furnace, basic operation, four heats per day, 6 days per week, working on highest quality castings of small and medium size. Costs of molten metal in ladle cover over one year period chrome steel, up to one per cent chromium $46; plain carbon steel, $40; white iron, $27.65 per ton.

Shop D—Power 1.25 cents per kilowatt hour; 6-ton furnace, acid operation, on medium sized steel castings, two to three heats per day, 5 days per week; scrap $14 per ton; molten metal in ladle $28.60 per ton.

The costs given are taken from operations which have been developed under the writer's supervision, and represent the highest type of metallurgical practice. Other figures from different shops show costs of from $30 to $60 per ton for molten steel, depending on the type of furnace, class of operator, costs of power and material, and regularity of operation. Prices on the Pacific coast will average 1 to 1.4 cents per kilowatt hour for power; $5 to $16 per ton for scrap; common labor 40 cents and semiskilled labor 80 cents per hour. The present rates for mechanics, molders, etc., ranges from 70 to 90 cents per hour. Electrodes, graphite, cost 20 cents, carbon, 7½ cents per pound; limestone $2.50, burned lime $10 per ton; fluorspar gravel, 85 per cent, $30 per ton; coke $20 per ton; ferromanganese and ferrosilicon, 5 cents a pound; ferrochrome 18 cents per pound.

As development proceeds the question of price will give way to that of quality, and the electric furnace will be used on the Pacific coast for all but the heaviest work. At the present time specialty shops are operating on manganese steel, white iron, gray iron for pistons and piston rings, oil well tools, acid proof iron castings and alloy steel castings.

Table II

Electric Furnace Installations on Pacific Coast

American Manganese Steel Co., Oakland, Cal.—Operating 3-ton heroult furnace, basic hearth, making manganese steel castings only.

Best Steel Casting Co., Oakland, Cal.—Operating a 6-ton heroult furnace, acid hearth, and a 1-ton rennerfelt furnace on basic; making carbon steel castings, alloy steel castings, gray and white iron castings, special alloy ingots.

Llewellyn Iron Works, Los Angeles, Cal.—Three-ton heroult furnace, basic operation, working on carbon and alloy steel castings, and high grade forging ingots, both carbon and alloy.

Monarch Foundry Co., Stockton, Cal.—One-ton heroult furnace, acid hearth, working on carbon steel castings.

Warman Steel Casting Co., Los Angeles, Cal.—Two 3-ton home-made furnaces, resembling a heroult, working on acid bottom, making carbon and chrome steel castings.

Southern California Iron & Steel Co., Los Angeles, Cal.—Six-ton heroult furnace, basic hearth; not operating; was installed to make high grade forging ingots.

Southern Pacific Co., Sacramento, Cal.—Six-ton heroult furnace, basic operation, making steel castings, forging and rolling ingots for its own use.

Keystone Iron Works, Los Angeles, Cal.—Three-ton 'lectromelt furnace, basic operation, carbon steel castings.

Union Tool Co., Torrance, Cal.—Three-ton heroult furnace, basic hearth, carbon and alloy steel castings, carbon and alloy steel ingots for its own manufacturing work on oil well machinery and tools.

Kay-Brunner Foundry Co., Los Angeles, Cal.—One-ton Vom Baur furnace, acid operation, on small steel castings.

Tannent Iron & Steel Co., Tacoma, Wash.—Two ½-ton Greene furnaces, acid operation on steel castings.

Pacific Car & Foundry Co., Renton, Wash.—One and one-half-ton Greene furnace, acid operation, on steel castings.

Lamb Machine Co., Hoquiam, Wash.—One and one-half-ton Greene furnace, acid hearth, on gray-iron and steel castings.

Aurora Foundry Co., Seattle, Wash.—Two-ton Greene furnace, acid operation, steel castings.

Everett Steel Co., Everett, Wash.—One-ton Greene furnace, acid operation, steel castings.

Olympic Steel Works, Seattle, Wash.—One 1-ton and one 2½-ton Greene furnace, acid operation, on steel castings.

Vulcan Mfg. Co., Seattle, Wash.—One and one-half-ton Greene furnace, acid operation, on steel castings.

Capital City Iron Works, Olympia, Wash.—One and one-half-ton Greene furnace, acid operation, on steel castings.

Skagit Steel & Iron Works, Sedro Woolley, Wash.—One and one-half-ton Greene furnace, acid operation, iron and steel castings.

Hanford Iron Works, San Bernardino, Cal.—Two-ton Greene furnace, acid bottom, steel castings.

Columbia Steel Co., Portland, Oreg.—One and one-half-ton Greene furnace, basic operation, manganese and carbon steel castings.

Los Angeles Foundry Co., Los Angeles, Cal.—One and one-half-ton Greene furnace, basic operation, sash and special window weights, and hard iron castings.

Pacific Foundry Co., San Francisco, Cal.—One-half-ton specially built furnace, basic operation, working on special analysis gray and white irons, monel metal.

Electric Steel Foundry, Portland, Oreg.—Three-ton 'lectromelt furnace, acid operation, steel castings.

Enterprise Foundry Co., South San Francisco, Cal.—Two 1-ton Girods, acid operation, on steel castings.

Using Manganese in Steel as Strengthening Agent

A method of preparing extremely pure iron has been developed at the United States bureau of standards. With this iron as a base, various commercial steels and other iron alloys have been made for the purpose of testing them without the complicating effect of impurities which usually are present in commercial iron and steel. These facts are set forth in *Scientific Paper* No. 464, issued by the bureau, which deals with the effect of manganese on the structure and properties of the steel.

The use of manganese as a strengthening agent in addition to the carbon is the subject with which the investigation was chiefly concerned. Manganese also is used as a deoxidizer and as a desulphurizer, but these uses are better understood.

The use of higher percentages of manganese for producing high tensile properties in low and medium carbon steels has been recommended at times by various metallurgists and to some extent such recommendations have been carried out in commercial practice. The results obtained in this investigation of the structural effects of manganese in steel strongly confirm such recommendations concerning this use of the element.

The general effect of manganese may be concisely described as a "restraining influence" so that the pearlite or carbon-bearing constituent of steel, even after annealing, exists in a fine grained condition if considerable manganese is present. In this respect the steel resembles in structure the condition which usually obtains in similar steels of low manganese content after rather rapid cooling, for example, air cooling. The mechanical properties of the annealed high manganese steel are quite similar to those obtained in the lower manganese steel by cooling it more quickly.

German Industries Now in Grip of France

THE Krupp Works at Essen are among the largest of the German industries to fall into possession of the French "for the exaction of reparations." Though still operated by the Germans, these works are surrounded by troops and are under military authority

A GENERAL view of the cast steel works of the Krupp establishment is to be noted above, while in the center of the page is Mechanical Workshop No. 9. Below is the "first bay" of the armor-plate machine shop, since the war devoted to other lines of manufacture

Iron and Steel Plants of the Invaded Ruhr

THE iron-ore handling equipment of the Friedrich-Alfred-Hutte works is illustrated above, ore being conveyed from barge to blast furnaces over long bridges. At the left is a general view of the Krupp foundries at Madgeburg-Buckau

THE colliery of Salzer & Neuck is located on the premises of the Krupp cast steel works at Essen. This is a typical view of the many German collieries of which the French now have control. German coal output is 40 per cent less than it was prior to the occupation

Promoting Health in Industry

A Series of Related Articles Dealing with Important Problems as They Affect the Industrial Workers—Consideration Is Given to the Best Practice in Eliminating Hazards and Providing Protection

BY C.-E. A. WINSLOW

III—Industrial Dusts and Poison Hazards

ASIDE from the general problems of ventilation, which are essentially the same in the workshop, the schoolroom or the auditorium, the factory manager often has to deal with atmospheric conditions of a special type resulting from the conduct of the actual processes of industry. Among the most serious of such conditions are those which result from the presence of certain varieties of dust.

Among the industrial dusts there are many different kinds, some of no sanitary significance and others which constitute a real danger to the health of the worker. Many of the common organic dusts such as those which are present in carpenter shops, flour mills and textile mills seem to have little influence upon health. Other dusts, such as those generated in processes involving the use of lead compounds may be poisonous; a problem which will be discussed later. A third class of dusts, including chiefly those of a metallic or mineral nature, constitutes a serious menace by injuring the lung tissue and predisposing to tuberculosis; it is with this problem that we are concerned at present.

It is probable that all hard inorganic dusts and certain organic dusts produce a more or less definite irritation of the lungs and the upper respiratory tract and the inhalation of any such dusts causes an increased tendency to diseases like pneumonia and bronchitis. With regard to tuberculosis, however, there are curious differences between the effects of individual dusts. Cement dust and coal dust, for example, are not associated with an undue amount of tuberculosis but rather the reverse. Coal miners show a tuberculosis rate distinctly below the average. On the other hand, quartz dust and metallic dusts, such as those to which tin miners, lead miners, granite and marble workers, sandblasters, grinders and polishers and pottery workers are exposed, do lead to an excess of tuberculosis so marked as to constitute an industrial problem of the gravest significance. In a study conducted under the direction of the author it was found that the grinders and polishers in a certain ax factory had a death rate from tuberculosis over ten times as high as that of the other employes of the same factory. Between one and two out of every hundred of these men died every year from tuberculosis as a direct result of the atmospheric conditions of the shops in which they worked.

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Expert Advice Is Essential

The problem of atmospheric dust is one which cannot easily be solved without expert assistance since it is not at all possible to estimate the danger involved merely by the appearance of the air of the workroom. It is the small particles of dust which are harmful and they may be present in dangerous amount in what looks like a clean atmosphere. Any industry which carries on grinding and polishing or generates metallic dust should, if possible, have the dust content of the air determined by an analyst to see whether a safe limit is being exceeded. Sometimes the state labor department or the board of health will be prepared to make such analyses. Otherwise a consulting expert in industrial hygiene may be employed; or in the case of a large industry the safety engineer or the chemist may easily learn to use a dust sampling apparatus.

Where atmospheric dust is present to a dangerous extent there are several practical methods of control adapted to the various processes concerned. In certain instances it is possible to eliminate atmospheric dust more or less completely by substituting a wet process of treatment for a dry one. Thus white lead is now ground under oil instead of in the old dry fashion; and one of the greatest poisonous dust hazards, that of rubbing down paint, can be accomplished by the use of a wet process with special waterproof sandpaper. Wet grinding wheels, other things being equal, produce much less dust than dry wheels. It is important, however, to note the qualifying phrase and to remember that wet processes of grinding may produce dangerous amounts of atmospheric dust. In fact, the enormous tuberculosis death rate in the ax factory to which reference has been made above, was due indirectly to the dust discharged from wet wheels of natural sandstone.

In other cases, the dust hazard may be controlled by carrying out dusty work in enclosed chambers fitted with exhaust ventilation. Various sifting and grinding and tumbling processes and the sandblasting of small objects are accomplished in this way and if the apparatus is properly constructed, the results may be wholly satisfactory.

Suction System Removes Dust

Dusty processes which must be carried out in the open can often be rendered safe, on the same principle, by the provision of hoods and exhaust ducts to carry off the dust from the point at which it is generated. The suction must of course be adequate—various state laws require a suction equal to 25 inches of water pressure—and the hoods must be properly designed so as to bring the dust at its point of origin into a draft of sufficient velocity. Studies in recent years have shown that the air of a grinding or polishing shop can be kept as free from dust as that of any ordinary workroom by properly designed apparatus of this type; but in order to be certain that success is attained, it is essential to check up now and then by actual determination of the dust content of the air.

Finally, in processes like the sandblasting of large castings none of the

procedures discussed above will serve. Here the workers necessarily must be surrounded by clouds of dangerous dust and can be protected effectively only by wearing an appropriate helmet and respirator. Personally the writer is skeptical as to the value of respirators alone for the protection of sandblasters or even of a respirator and helmet together if the helmet is not provided with positive air pressure. If, however, the helmet be connected with an air pressure line maintaining a slight positive air pressure so that there is a constant outflow through its wire mesh an entirely adequate protection may be secured.

Industrial processes in which poisonous substances must be used are almost innumerable; and textbooks on industrial hygiene contain lists of hundreds of such poisons. Some of them are used only rarely and few workers are exposed to their effects. Others are only slightly poisonous causing perhaps no discomfort more serious than a temporary irritation of the skin. Some, on the other hand, are used by many workers and are so poisonous as to produce a considerable number of deaths every year.

Of all the industrial poisons the compounds of lead are by far the most important. Thus in New York state for the five years 1911-1916 there were reported 484 cases of lead poisoning due to arsenic, 15 to brass, six to mercury with two deaths, one fatality to phosphorus and two cases to wood alcohol, one fatal.

Metallic lead itself is not toxic but the fumes which form when it is melted are poisonous and the various lead salts, such as the carbonate (white lead), the acetate (sugar of lead), the various oxides (red lead, litharge) are exceedingly toxic. Lead smelting, white lead making, the manufacture of storage batteries, the manufacture of pottery and sanitary ware and above all painting with red and white lead paints are perhaps the most dangerous of the lead processes, although in a great variety of industries certain of the workers are exposed to poisoning from the use of lead compounds.

Means for Prevention

Lead poisoning is effected either by the breathing of an atmosphere laden with lead dust or by getting lead compounds into the mouth from the fingers or in other ways. As a rule the inhalation of dust is by far the most important factor. First and foremost then, the worker who uses lead salts, or other poisonous compounds, should be protected by all possible devices for controlling dust. Dusty processes should be carried on whenever possible in enclosed spaces or under water or oil. Hoods and exhaust drafts for the removal of dusts and fumes should be installed; and where all other methods fail, the workers must be protected by effective masks, respirators or helmets.

In addition to such measures for the control of atmospheric dust it is almost equally important to provide for cleanliness as it will reduce the danger of transferring the poisons directly to the mouth. Impervious and well cleaned floors and work tables, the prohibition of eating in the work room with the provision of a clean and convenient lunch room, special working clothes with separate lockers for home and work clothes, hot water, soap and nail brushes with allowance for washing up on company time—these are among the chief conditions which will reduce the danger of the poison hazard to a minimum.

Frequent Examinations Are Urged

Finally, the workers in lead should without exception be subjected to a full physical examination at regular intervals as often as once a month for the detection of early signs of poisoning which indicate the necessity for an immediate change to some other job where the lead hazard is not involved. Lead poisoning often may be detected by pallor, minor digestive disturbances, a bluish lead-line around the gums, a chemical test of the urine or an examination of the blood, before it manifests itself in the severe form of "painter's colic" or "wrist-drop."

If taken in ample time the damage will not be serious. If the process goes on, the heart, blood vessels and kidneys will be injured so seriously as to lead to premature disability and death, in the course of a few years.

It is impossible in a brief article even to list all the industrial poisons but mention may be made of the mercury salts which cause "hatter's shakes" in the felt hat industry, of arsenic salts which cause serious skin irritations among workers with paris green, of the fumes from molten brass which cause "brass-founder's ague," of the fumes of nitric and hydrochloric acid which irritate the membranes of nose and throat, of carbon monoxide, of wood alcohol, naphtha and benzine, and of the various poisonous substances used in the munition industries. The general methods of control are much the same in most cases as those discussed above, the removal of dusts and fumes and the periodic medical examination of the workers being always of primary importance.

Carbon monoxide is given off from ovens, furnaces, and all sorts of heat sources when combustion is incomplete. It is a sudden and acute poison causing throbbing of the temples, nausea, hallucinations and sometimes almost instantaneous death. Its control may to some extent be effected by supervision in regard to leaks but in many industries there will always be danger of gassing. Where such danger exists workmen should go about in pairs and if on elevated platforms supported in some way so that a loss of consciousness would not involve a fatal fall.

Good Ventilation Is Important

Wood alcohol, naphtha and benzine are among the most important industrial poisons, not because their effects are serious but because so many workers are exposed to their influence. These substances are widely utilized as solvents in a great variety of industries and their fumes when inhaled produce digestive disturbances, dizziness and mental confusion. The remedy lies in the use of receptacles for these substances which are so constructed as to give off a minimum amount of fumes, in the use of hoods and local ventilating systems for drawing off fumes from the area where they are produced, and in good general ventilation of the workroom.

In the munition industries the greatest menaces are the fumes of the oxides of nitrogen and trinitrotoluol (TNT). The former produce a burning of the delicate membranes of the lungs which often is rapidly fatal. The latter, TNT, causes a peculiar form of toxic jaundice. The liberation of the nitrogen fumes is usually due to an accident, the boiling over of a kettle or the breakage of some container. TNT poisoning results chiefly from the handling of the trinitrotoluol and must be controlled by the wearing of gloves and other special clothing and by personal cleanliness. Here as in every problem of industrial poisoning, medical examination is of supreme importance.

1922 Copper Production Shows Gain

Smelter production of copper in the United States in 1912 is estimated by the geological survey to have been 981,000,000 pounds, an increase of 475,000,000 over 1921. The total production of new refined copper from domestic sources is placed at 897,000,000 pounds, a gain of 288,000,000 pounds over 1921. Refinery production of new copper both from domestic and foreign sources, including imports, in 1922 was about 1,398,000,000 pounds. Refineries also had an output of 112,000,000 pounds of secondary copper last year, bringing the total for the refineries up to 1,510,000,000 pounds. Stocks of refined copper in the hands of domestic refiners on Dec. 31

are estimated as 277,000,000 pounds, against 459,000,000 pounds on Dec. 31, 1921. Blister copper in transit, in process of refining or in the hands of smelters on Dec. 31 is believed to have totaled 352,000,000 pounds, a gain of 69,000,000 pounds over Dec. 31, 1921.

The Aluminum Goods Mfg. Co., Manitowoc, Wis., distributed more than $25,000 among its 3000 employes at Manitowoc, Two Rivers, Wis., Newark, N. J., and St. Louis, as a holiday bonus, approximating the equivalent of two days' pay of each employe.

Lays Power Cable Across San Francisco Bay

BY DON PARTRIDGE

BY LAYING across San Francisco Bay its fourth and what is claimed to be the world's largest and longest submarine cable for the transmission of electrical energy, the Great Western Power Co., of California on Jan. 8 connected up the final link between the 200-mile transmission line of its Caribou power plant in Plumas county and its Mason street substation in San Francisco. This cable, part of which is shown in the accompanying illustration, coiled on the deck of the barge, was laid in the remarkably short time of 2 hours and 37 minutes.

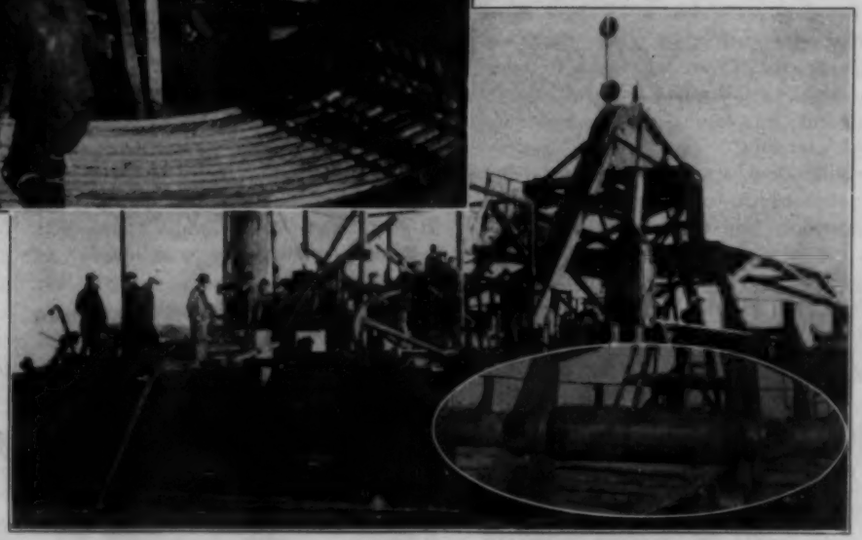
The cable, which is about 5 inches in diameter and weighs approximately 500 tons, or more than 20 pounds per foot, is designed to carry 11,000 volts, 3 phase, totalling over 15,000 horsepower. An armor of heavy steel wire protects the cable which is made up of three well insulated stranded conductors. In addition, several sets of telephone cables are located inside. Nine gondolas were required to transport the cable from the Worcester, Mass., plant of the American Steel & Wire Co., where the cable was made, to San Francisco where it arrived on Dec. 15. Under the supervision of A. O. Hoeftmann, cable engineer for the American Steel & Wire Co.; Mr. Madison superintendent of the same company; W. G. B. Euler and John Knootz, general superintendent and chief engineer, respectively, of the Great Western Power Co., plans were made for the splicing and laying.

Seven individual splices were made, each splice requiring 12 hours to complete. One of the finished splices is shown in the insert in the accompanying illustration. The cable as one unit was then placed about the laying barge upon which a special rigging for paying off had been erected, as shown in the illustration. During the actual laying, the barge was propelled by three tugs, one in front and one on either side. The course was from Pier 41 at the foot of Mason street, San Francisco, to the Richmond shore line in Contra Costa county.

Including supervision and laying, the total cost of the cable was over $250,000, but saved the Great Western Power Co. several times this amount in eliminating the previous type of overhead construction around San Francisco Bay. At the completion, the cable was subjected to a test of 35,000 volts, or three times the normal voltage it had been designed to carry, without any indication of trouble. The original cable of the company was installed in 1912 and is of about half the length and carrying capacity of the one just laid.

The laying of the second and third cables followed closely the laying of the first at intervals of two years. These four cables now supply San Francisco with hydroelectric capacity exceeding 50,000 horsepower.

The cable was coiled about a special rigging erected on the deck of the barge and was payed out by allowing the coils to rise upward and over the top of the rigging. The cable is 5 inches in diameter



This view shows the cable being payed out over the stern by means of the rigging. The inset shows one of the seven splices which were made

Choosing Steels for Structures

Present Period Is an Epoch Between Low Carbon and Alloy Steel Periods—Various Alloying Elements Are Available, Many of Which Possess Advantages—Special Ore May Be Used

BY GEORGE K. BURGESS

DEVELOPMENT of structural metals may be divided in four periods designated by class or grade of material as follows: Wrought iron; low carbon steel, at first bessemer and then basic open hearth; alloy steels; and heat treated steels, including high carbon and alloy steels. The wrought iron stage gave way to that of bessemer steel but gradually; the gradation from bessemer into basic open hearth encountered no opposition, it being mainly a question of cost, convenience and capacity of manufacturing. Bessemer steel still is furnished for buildings.

We are living in an epoch intermediate between the low carbon steel and the alloy steel periods. The great mass of structural steel tonnage is low carbon, basic open hearth steel, and many think it should remain so; nevertheless, several important bridges have been built using alloy steels, particularly of nickel and more recently of silicon and nickel-chromium either in combination with carbon steels or alone; and in a few instances less important and smaller members of large bridges have been of weight reducing heat treated steels.

Follow Accepted Practice

In addition to the type of steel to be chosen for the various parts of a structure, many auxiliary questions must be considered and to some of them satisfactory answers are not forthcoming; such as the relative behavior of thick and thin sections, of solid and fabricated members, the best design for each; the limitations of riveting and the possibilities of welding; the allowable working stresses for each class of material, design and load; prevention of or protection against corrosion which is a different problem for structures exposed to atmosphere and for enclosed structures as city buildings, parts of which may also be subject to deterioration from stray electric currents; and as a final illustration the resistance to and protection from fire.

The structural engineer should go slowly in accepting new ideas and applying them. An engineering structure often is a costly one and it is usually built on a noncompetitive basis as far as the engineering features are concerned; the engineer therefore holds himself bound to follow accepted practice. For many types of structure also he is restrained by building codes and specifications of technical groups or societies that tend to crystallize existing practice.

In contrast to this enforced conservatism of the structural engineer, the freer position of the mechanical engineer, who also deals in metals, should be noted. Employed by the manufacturer, he is engaged in designing and distributing his product under keen competitive conditions and he is thereby stimulated constantly to improve it. We have but to mention the marvellous strides made in our knowledge and economical use of steels by the automotive industry to illustrate what progress is possible.

In the accompanying table are included typical American Society for Testing Materials structural steel specifications, some of the British Standards committee, and there are also included a few steels which do not appear to have been endorsed by any specification making body but nevertheless have been used in important engineering structures. Among these are a so-called silicon steel and a nickel-chromium steel. It will be noted that the British permit somewhat higher tensile strength, have no elastic limit requirement, and their ductility and chemical requirements are less severe than the American.

As to the limitation of sulphur and phosphorus attention might be called to the fact that it would appear to have been the general practice to frame specification limits for these two elements to meet what could readily be obtained by the current manufacturing practices for structural steel. Thus the A. S. T. M. specifications of 1901 for buildings have no sulphur limit and permit phosphorus up to 0.1 per cent, and for bridges and ships the sulphur limit is 0.06 and that for phosphorus 0.08 per cent for acid steel and 0.06 per cent for basic steel; while the 1921 specifications restrict the phosphorus in open-hearth steel to 0.06 per cent for buildings, and for bridges the sulphur limit is 0.05 per cent while phosphorus limits have become 0.06 and 0.04 per cent. The present physical requirements, on the other hand, are somewhat less severe than those of 1901 for steel for buildings and bridges.

It has long been considered a desideratum to find an alloying element which can be added to structural steel at low cost and increase its strength and elastic limit without lowering the ductility and without resorting to special thermal or mechanical treatment. It has also been considered by some engineers that the present type of structural steel might be improved considerably by refinements in manufacture without essential change of composition or appreciable increase in cost, thus making for greater uniformity of product which might allow of raising the permissible stresses. For certain structural members also the possibility of raising the carbon content somewhat at the expense of ductility has been considered, which would make for reduction in weight; and finally two or more of these suggestions have been combined, as raising the carbon and also adding an alloying element such as nickel which tends to maintain the ductility, giving a satisfactory structural steel of considerably enhanced permissible stresses, say 28,000 pounds per square inch as compared with 16,000 pounds per square inch.

Weight Decreases Stiffness

A well known factor that has to be taken into account in structural steel when weight is decreased and stresses increased, particularly for structures such as the larger bridges subject to heavy and variable live loads, is the greater deflection and consequently decreased stiffness undergone by the structure. These effects necessarily accompany the use of higher allowable stresses for a material like steel, all of whose alloys show no change in the modulus of elasticity. This may in some cases be counteracted by introducing strains of opposite sign during fabrication; and for each type and design of structure there is undoubtedly a best practice to be followed for a given material.

There are certain manufacturing characteristics generally common to all steels, but in diverse degree, such as piping, segregation, effect of impurities including oxides and gas inclusions, internal stresses, and surface defects, but from which ordinary low carbon structural steel may be and often is singularly free. With

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From a paper presented at the New York meeting of the American Society of Civil Engineers, Jan. 17-19. The author is chief, division of metallurgy, bureau of standards, Washington, and president, American Society for Testing Materials.

the increase of carbon and especially with alloying elements in increasing amounts, it is more and more difficult and often impossible practically, to make steel ingots free from pipe, and these more complex steels are also usually more subject to other defects such as internal irregularities of composition and surface flaws, all this resulting thereby in greater manufacturing losses such as increased discard for pipe and rejection for variation in composition, properties, or condition of surface. In other words, as the complexity of the steel increases, the difficulties and cost of manufacture increase with a corresponding uncertainty in uniformity of the product, necessitating also a more rigid inspection.

Numerous Elements Available

Among the alloying elements that have been suggested, and in some cases used, are nickel, alone or together with chromium as for steel made from Mayari ores, vanadium, chrome-vanadium, silicon especially in association with higher manganese, aluminum which appears not to have been used except as a deoxidizer, and titanium. Other possibilities are copper and perhaps molybdenum.

It is interesting to note that as far back as 1904 the Pennsylvania Steel Co. offered a special high carbon steel for structural work of the Manhattan bridge to have an elastic limit of 45,000 pounds per square inch, a tensile strength of 85,000 to 95,000 pounds and elongation in 8 inches of 1,500,000÷tensile strength per cent; this steel carried from 0.50 to 0.60 per cent manganese, 0.45 per cent carbon together with low silicon. The question naturally arises, can not a carbon steel of higher yield point than shown in the accompanying table be used advantageously and safely for structural purposes? We may compare the above with the latest specifications, those of the proposed Sydney Harbor river bridge, which has a central span of 1600 feet. These allow the contractor to use either carbon steel, nickel steel or chrome-nickel steel.

Nickel Raises Yield Point

Considering first the use of nickel in structural steels, the properties of 3.5 per cent nickel steel have been generally recognized for some 15 years or more, the manufacturing conditions and costs are well established and there are in existence widely accepted specifications as A. S. T. M., A8-21; in the accompanying table. Up to 0.45 per cent carbon is allowed in this steel which has a yield point nearly double that of low carbon structural steel but with slightly less ductility

This material was first used in bridge construction about 1904 in the Blackwell's Island bridge designed by Mr. Lindenthal. J. A. L. Waddell has advocated insisting on 55,000 or even 60,000 pounds per square inch yield point for this grade of steel, but it should be borne in mind that if the chemical composition is kept constant, the yield point can be raised only by thermal or mechanical treatment (as by cold working it), a procedure which tends to make for lack of uniformity of properties. This implies a best value for the finishing temperatures of rolling any given section of a material. It may be that 50,000 pounds per square inch yield point is too low for this material, but then the specified tensile strength and ductility are probably also low. This material as used in the construction of the St. Louis bridge for annealed specimens averaged 99,850 pounds per square inch ultimate strength 60,250 pounds yield point, 17.9 per cent elongation in 8 inches and 53.3 per cent reduction in area, with a chemical composition of carbon 0.38, manganese 0.58, nickel 3.45, phosphorus 0.012, and sulphur 0.03. In the Manhattan bridge about 8000 tons of plates and shapes of nickel steel were used and nickel steel rivets as well. The requirements were tensile strength 85,000 to 95,000 pounds yield point 55,000 pounds, elongation in 8 inches 1,600,000÷T. S. per cent. Nickel steel also has been used in the following bridges, the new Quebec, Frott in Kansas City, jacknife of Chicago, and the Detroit-Superior high level bridge at Cleveland.

Copper Offers Some Advantages

The element that best may be compared with nickel for addition to structural steel is copper which has been shown to increase the strength, yield point, and resistance to shock and to atmospheric corrosion, without loss of ductility. A series of experimenters have definitely disproved the idea of embrittlement of low and medium carbon steel by copper. A steel containing 0.38 per cent, carbon, 0.57 per cent manganese and 0.86 per cent copper will have a yield point close to that of 3.5 per cent nickel steel with considerably greater ductility. In the tests of Hayward and Johnston the elongation in 2 inches was 27.3 per cent and the reduction in area 52.7 per cent as compared with the requirements of nickel steel of 16 and 25 per cent, respectively, in A8-21 of the accompanying table.

Clevenger and Ray have noted the tendency of copper to segregate toward the bottom of small ingots when over 0.8 per cent is added as metallic copper.

The relatively low cost of copper and also the ease with which copper may be added to structural steel indicate that it should be recommended, at least after trial in some large heats on full size structural members. In fact this appears to be a most promising field of research from the points of view

Comparisons of Some Structural Steel Specifications

Type of steel	No.	Process of manufacture	Phosphorus % Max. acid	Phosphorus % Max. Basic	Sulphur % max.	Carbon % max.	Nickel % minimum	Tensile strength pounds per square inch	Yield point pounds per square inch minimum	Elongation in 8 inches, % minimum	D on 180 degrees cold bend ¾-inch	D on 180 degrees cold bend ¾-inch	
A.S.T.M bridge	*A* 7-21	Open hearth	0.06	0.04	0.05	...	.....	55,000-65,000	0.5T.S.	(1)27.3-18	1T	2T	3T
A.S.T.M. Nickel	*A* 8-21	Open hearth	0.05	0.04	0.05	0.45	3.25	85,000-100,000	50,000	(1)17.6-14	1T	2T	
A.S.T.M buildings	*A* 9-21	Open hearth	0.06	0.06	...	...	.....	55,000-65,000	0.5T.S.	R.A.-25			
		Bessemer	0.10				.....	55,000-65,000	0.5T.S.	(2)25.4-18	0T	1T	2T
A.S.T.M locomotives	*A*10-21	Open hearth	0.05	0.05	0.06	...	.....	50,000-65,000	0.5T.S.	(1)25.4-18	0T	1T	2T
A.S.T.M cars	*A*11-21	Open hearth	0.06	0.04	0.06	...	.....	58,000-68,000	0.5T.S.	(1)30 -18	0T	1T	2T
A.S.T.M ships	*A*12-21	Open hearth	0.06	0.04	0.06	...	Si.0.20-0.45	80,000-95,000	45,000	(1)26 -18	1T	1½T	2T
Silicon	.....	Open hearth	0.06	0.04	0.05	0.40	Mn. 1.00			(3)20 -16.8	1T	1½T	
Mayari	.....	Open hearth	0.06	0.04	0.05	0.40	Ni. 1.20†	85,000-100,000	50,000	(3)18.8-16			
British:							Si. 0.15			R.A.=30			
							Mn. 0.30						
Bridges	15-1912	Open hearth	...	0.06	0.06	...	.....	62,720-73,920	.....	20 -16*	1½T		
Buildings	15-1912	Open hearth	...	0.08	0.06	...	.....	62,720-73,920	.....	20 -16*	1½T		
Ships	13-1910	Open hearth	...	...	...	...	.....	62,720-71,680	.....	20 -16*	1½T		

(1) Based on 1,500,000 T. S. (2) Based on 1,400,000 T. S. (3) Based on 1,600,000 T. S.
*For steel below 0.375-inch in thickness. †Maximum.

of engineering, metallurgy and economy, and probably it would be worth while to carry out an investigation to determine the best metallurgical practice, manufacturing costs, and most suitable limits for copper, either alone or with other elements, such as nickel and manganese, in structural steel, similar to that reported by Mr. Waddell for nickel steels.

It may be recalled that some American iron ores carry copper which goes into and remains in the steel which often contains 0.25 per cent copper to its improvement. There might be advantage in using either the copper-nickel ore from which monel metal is made, for example, or some intermediate product or even monel metal itself in producing an economical copper-nickel structural steel.

The case for vanadium as an alloying element has been attractively stated by G. L. Norris, although as Mr. Waddell pointed out, this exhibit was not without ambiguity either from the metallurgical or cost point of view. The advantages of vanadium appear to be greatest in association with chromium for steels to be heat treated.

Special Ore Is Utilized

An interesting possibility is the greater development of nickel-chromium structural steels using such ores as the Mayari as a base. Large steel columns made from this steel containing 1.12 to 1.58 per cent nickel and 0.37 to 0.66 per cent chromium were tested at the bureau of standards for the Metropolis and Memphis bridges.

Some of these steels also had a copper content up to 0.1 per cent. Credit is due to Mr. Modjeskie for the first use of Mayari steel in bridge construction, namely for the Memphis bridge. A large number of smaller railway bridges since have been constructed in which Mayari steel has been used.

Another alloy steel that is coming into use for structures, such as parts of the Delaware bridge, is the so-called silicon steel shown in the accompanying table, which might perhaps be as well named a silicon-manganese steel as the specifications call for a carbon maximum of 0.40 per cent, silicon 0.45, manganese 1.00, with a silicon minimum of 0.20 per cent. The raising of the elastic limit by increase of silicon seems to be of English origin. The Sandbergs urged the use of 0.3 to 0.4 per cent silicon in rail steel some 20 years ago. Silicon steel appears to have been first produced in America by the Cambria and Carnegie Steel Cos. in the form of plates and shapes for light torpedo boat destroyers about 1908 or 1910, for which the navy department desired a steel of 80,000 to 90,000 pounds per square inch tensile strength and a steel carying approximately 0.75 per cent silicon, 0.60 to 0.80 manganese and 0.30 to 0.40 per cent carbon was produced for that purpose. The Carnegie Steel Co. in 1912 made the first proposal of a silicon steel for bridge construction, for the eye-bars and structural steel of the Memphis bridge.

Here is again a case in which a so-called impurity, silicon has become a desirable and relatively cheap alloying element, imparting strength and high elastic limit to the steel. The present specification, however, is really a double one permitting the physical properties desired to be attained by either high silicon or high manganese. The manufacturers naturally will furnish a steel of an adjusted composition depending on the relative price of ferrosilicon and ferromanganese. Steel of this type also was tested at the bureau of standards in the form of large columns for the Metropolis bridge. The bureau now is making additional tests of this steel made up into fabricated parts for the Delaware bridge.

The role of titanium has been well described by Mr. Petinot to be primarily that of a deoxidizer and scavenger and an effective agent for reducing segregation. Usually it is added with the ladle additions in the form of ferro-carbon-titantium containing 16 per cent titanium about 8 to 12 pounds of the material to a ton of steel, and there remains in the steel less than 0.02 per cent titanium.

The bureau is just completing an investigation of the manufacture and properties of two 1000-ton lots of rail steel, 0.75 per cent carbon and 0.76 per cent manganese, treated with titanium as compared with similar steel deoxidized with ferrosilicon. The mechanical properties of these two steels are not markedly different but the titanium treated steel has less segregation in the upper part of the ingot and shows a slightly greater tendency toward piping. One would expect still less differences for low and medium carbon steels.

As to the possibilities of improving the physical properties of ordinary structural steel—yield point and ductility—by endeavoring to produce steel more highly purified, it is questionable if much is to be gained by this means. A series of experiments just completed at the bureau on the mechanical properties of pure alloys of iron, carbon and manganese, containing no phosphorus, with sulphur and silicon less than 0.01 per cent for most of the samples, show that although there is a slight improvement in ductility there is a corresponding decrease in strength and elastic limit as compared with commercial steels of same carbon and manganese contents.

In view of the almost negligible importance of the phenomena of fatigue for most structural steels of interest to the civil engineer, the question of further freeing the steel from entranced inclusions, although it may be said to be desirable, yet appears not to be vitally essential, and probably would not allow raising the permissible stresses while the cost would be increased. Structural steel is much less to abuse in service than is rail steel, for example, and the manufacturing practices permitted by the specifications for the latter do not necessarily result in clean steel. This should not be taken as an argument for dirty steel, but it must always be borne in mind that for any engineering material there is a most economical procedure in manufacture to meet the engineering requirements. The manufacturer, in general, can meet more rigid requirements but not without increased costs, except as his art is improved.

(To Be Concluded)

Using Wire for Cutting Slate and Marble

Wire saws have been used with success in marble quarries, both in America and abroad, states the United States bureau of mines in a recent bulletin on "The Technology of Slate." The saw usually consists of a three-strand endless wire rope about ¼-inch in diameter. The wire passes around a driving wheel and is carried on pulleys to the place in the rock where a cut is desired. An abrasive, such as steel shot, with water, is fed to the rope at the point where it enters the rock. To prevent too rapid abrasion of the wire, a length, sometimes exceeding a mile, of wire rope is used. The wire saw may be used for making cuts in the quarry or to saw blocks on the bank. This equipment never has been used in slate quarries in the United States. A Pennsylvania producer plans its introduction.

In a bulletin of the United States bureau of mines it is stated that theoretically titanium should be possible of production by several methods including electrolysis of the oxide in a solution of dry halogen salts of the alkaline earth metals heated to moderate redness; reduction of the titanofluorides by the alkali metals; reduction of titanium dioxide with carbon; and reduction of titanium tetrachloride with sodium. However, the last is the only method that actually yields pure titanium, and the metal is produced commercially by that process today.

Fig. 1—The old method of hand assembling detachable chain still is used extensively and for special shapes probably never will be replaced

Producing Detachable Cast Chain

Introduction of Assembling Machine for Locking Together Malleable Iron Links Makes Possible an Output Three Times Greater Than with the Hand Method—Casting, Finishing, Annealing and Assembly Operations Described

BY HERBERT R. SIMONDS

IN designing chain of any type, one of the chief considerations is the method of connecting the individual links. Wherever the links are joined in the actual process of manufacture, as is the case in cast steel chain and forged chain, the problem is removed from that of manufacturing an individual link and becomes one wherein the entire length of chain must be considered. Individual links for cast anchor chain sometimes are made up separately and spaced a link apart in a row in a long mold, the intermediate links then being cast through these first links, but here half of the links must be considered as a part of the completed chain and not as individual pieces. Malleable detachable chain has been designed to overcome the consideration of a whole length of chain in the manufacture of each individual link. In the manufacture of detachable chain such as that shown in Figs. 1 and 2 each link is made separately just as a pipe fitting or a sprocket wheel is made. The individual molder may never see the completed chain. His job is to produce accurate links, and when this is done, his responsibility ends.

The author is associate editor at Boston of IRON TRADE REVIEW.

The design of detachable chain is not as simple as it at first appears. The links must fit together easily so as to reduce the cost of assembling, and yet they must not come apart so easily that the chain would be separated in handling. The link must be simple so as to reduce cost of making molds and pouring castings. It is the usual practice to cast from 8 to 72 links in a single mold depending upon the size of the chain. For chain of from 1 to 3-inch pitch, from 8 to 16 links usually are made up on a single gate. Such an arrangement is shown in Figs. 3 and 6. The links are each connected with the central heavy gate at two points, the design of feeders and risers has been worked out carefully to give a quick and simultaneous flow of metal to all parts of the mold. In the design of this chain each link, in effect, has a shaft at one end called the end bar, and a cutaway journal at the other end called the throat. A slight notch, *A*, Fig. 3, is left at one end of the end bar of each link and it is this that makes it possible for the throat of one link to be slipped over the end bar of the next, thereby developing the chain.

Illustrating this feature of design Fig. 1 shows the operator assembling 2-inch pitch chain by hand. This particular chain is molded on machines such as that shown in Fig. 6. Here it may be seen that the pattern consists of a permanent gate carried in a frame. One side of this gate forms the drag and the other the cope. The cores forming the throat of each link consist of short cylinders which are

placed in the drag shown on the molding machine. The method of making the mold is similar to that for any careful gate work except that the tolerance is unusually low because of the necessity of a close fit between the links. The work, however, even though it must be accurate, is performed rapidly by experienced molders. One molder with the equipment shown in Fig. 6 will turn out 1500 links of 3-inch pitch chain in a day of 8 hours. The castings as they appear when shaken from the molds are shown in Fig. 3. These are broken off from the gate, are inspected, ground and then annealed.

Annealing Important Operation

Chain is more easily subjected to tensile tests than most other forms of castings. Two lengths of chain of a similar size may be compared easily by stretching to destruction on a simple form of testing machine. It is perhaps for this reason, as much as for the actual service requirements, that chain manufacturers are anxious to secure as high a tensile strength as possible. Whatever the reason, the strength of the metal entering into the construction of cast malleable chain has been the subject of more than usual attention. To illustrate the development along this line, some years ago a 5-foot length of about 1-inch pitch chain suspended at one end

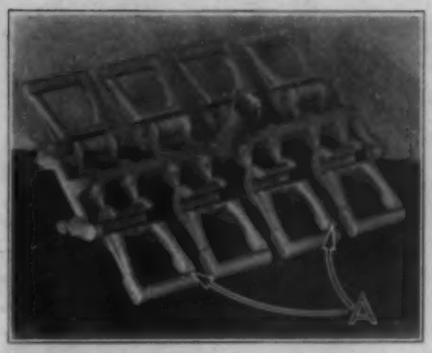


FIG. 3—CHAIN LINK CASTING AFTER BEING SHAKEN FROM THE MOLD

would break under a 1000-pound weight carefully applied at the lower end. Today a good grade of 1-inch pitch chain of similar design will easily carry a weight of 1800 pounds.

To obtain this strength in small sections of malleable iron, it has been necessary to study closely every step in the manufacture. The analysis of the metal as it is tapped from the furnace is an important consideration, but equally important is the annealing process. In annealing three principal points must be considered: 1. Securing of the proper softness in the iron; 2, prevention of warping; and 3, limiting the formation of scale. The desired iron softness is obtained by a study of the white iron or hard iron analysis and the application of heat of the correct temperature for precisely the right length of time.

The problem of warping in the case of chain links is an important consideration because even a slight distortion will prevent easy assembling and may cause excessive wear at one side or the other of the end bar when the chain is in use. For this reason the links are packed carefully in annealing pots as shown in Fig. 5.

Packed With Mill Scale

The space between the links is filled with mill scale and the whole pot is vibrated after being filled so as to obtain a more compact and even distribution of pressure around the individual pieces. In the plant of an eastern manufacturer, where the illustrations in this article were secured, these pots filled with link castings are placed in tiers of five and are then transferred by means of a lift truck to a large annealing oven where they are subjected to a gradually rising temperature over a period of about 36 hours. At the end of this time the temperature, which has reached 1500 degrees Fahr. is maintained on an even level for 72 hours, after which the furnace is allowed to cool down gradually to about 200 degrees Fahr., when the annealing pots are taken out and dumped onto grids which catch the castings, but allow the packing material to fall through. The mill scale is used first to perform the me-

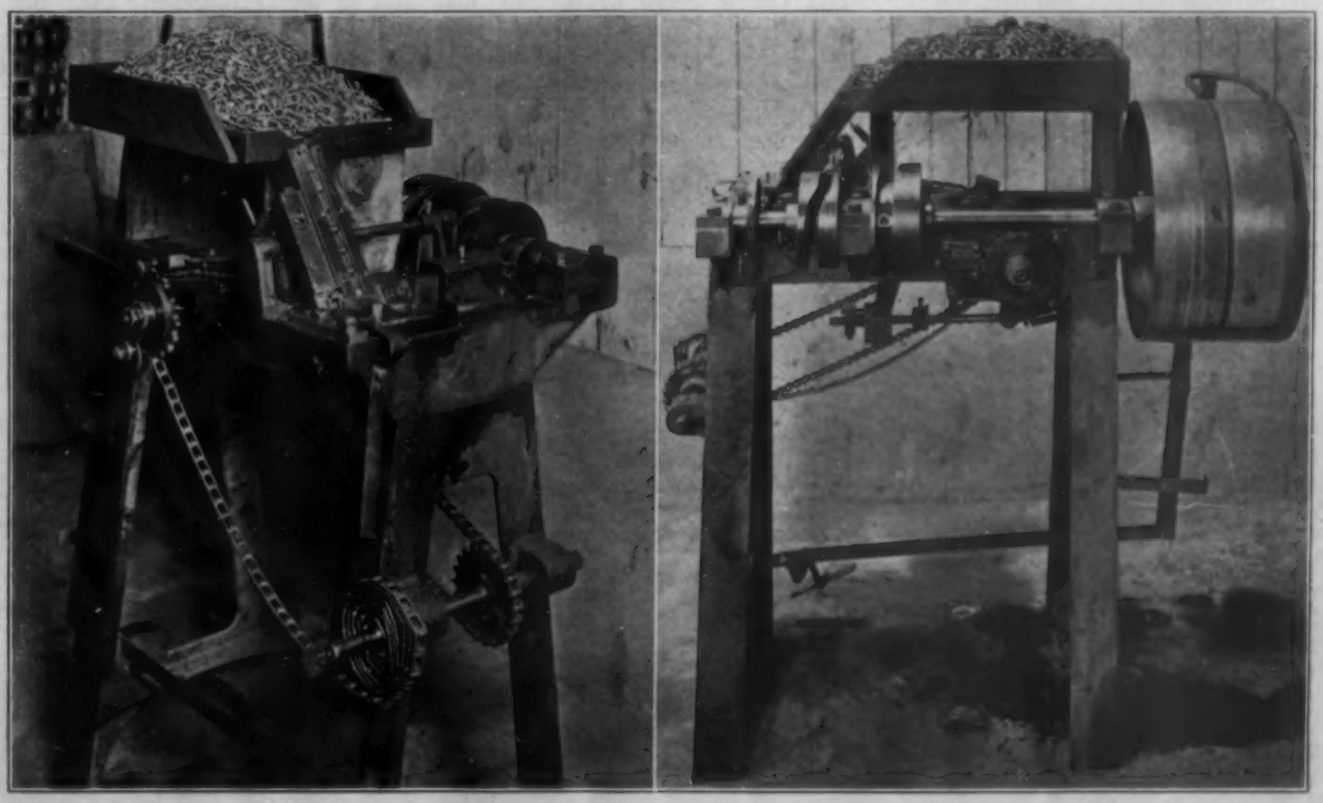


FIG. 2 (LEFT)—THE NEW METHOD OF ASSEMBLING CHAIN IS BY A MACHINE WHICH IS ABOUT THREE TIMES MORE RAPID THAN THE HAND METHOD. FIG. 4 (RIGHT)—BACK VIEW OF THE ASSEMBLING MACHINE SHOWING THE DOUBLE RATCHET AND DOG MECHANISM AND THE THREE OPERATING CAMS

FIG. 3—CARE IN PACKING THE LINKS IN THE ANNEALING POTS IS NECESSARY TO GUARD AGAINST WARPING

chanical duty of preventing warping and second the chemical duty of preventing the formation of scale.

Assembling the Chain

From the grids where they are dumped after annealing, the castings are transported to an inspection room. Here they are given a second inspection so that the links which leave this department for the assembly room are uniform and practically flawless. The assembling operation is one of the most interesting in the whole process of manufacture. For one link to slip onto another, the two must be at an angle, one with the other, of from 60 to 70 degrees. Fig. 1 shows the hand method of assembling this chain. Each new link is taken from a stock pile placed at the proper angle with respect to the last link of the chain and then pressed down into place and straightened.

For many years it seemed impossible to devise a machine which would perform this simple operation automatically. One difficulty after another appeared to prevent the successful operation of such a machine. Finally, however, a few companies in this country have succeeded in overcoming all of the obstacles and now have successful machines in regular operation. One such machine is shown in Figs. 2 and 4. The links are held on a tray above the machine and are fed into the upright slide by hand. This is the only manual part of the operation. Once having entered the slide, the links are carried down successively, shoved into place on the end of the chain which is being formed, and the chain itself is rolled up in convenient form to be tested, boxed and shipped. Because of the unusual nature of these automatic assembling machines, a little more detailed description may be of interest.

At the right-hand side of the machine as shown in Fig. 2, a camshaft extends from front to back and provides the propelling force for the different operations. This shaft is driven either from a motor or belt and usually is arranged for a variable speed. The first cam at the front of the machine operates a plunger which moves across the lower end of the magazine slide. The plunger is returned to its right-hand position by a spring and is forced by the cam the full left-hand stroke against this spring. The operation is as follows: A link descends by gravity down the magazine chute to the lowest position, where it bumps up against a steel limit piece. The angle of the magazine and also of the steel guide plate at the left of it, in the illustration, is the exact angle required for joining the links of the chain as previously described. The last link of the assembled chain is held in the correct location to receive the new link in a manner which will later be described. The new link which is to be pressed onto the chain is in its proper position for assembling and merely needs to be forced a few inches to the left and onto the last link which is waiting. The plunger previously mentioned furnishes the means of accomplishing this, and at the same time holds up the following links in the magazine.

Adjusting the Links

When the new link has been forced onto the chain, the plunger returns to the right and allows the next link to fall into the lower position. At the same time another cam on the camshaft operates a sprocket which carries the chain forward the length of one link and the operation is repeated. A third cam operates an upright plunger which is used to hold the last link of the chain in place. This cam is the second cam shown in Fig. 2 and the plunger which it operates is inside the steel box at the left of the magazine. A small portion of the upper end of this plunger may be seen above this box in the illustration. The movement of this plunger is so timed that it lifts up while the sprocket is moving the chain forward one notch. It then descends to catch the last link and shove it into place against a spring limiting piece.

Mechanical Difficulties Overcome

One of the chief difficulties in developing an automatic chain linking machine has been the accurate placing of the last link of the chain. The links, while unusually accurate and uniform for castings, have some slight variation in dimension, and this may be accumulative after the chain is built up. The upright plunger just mentioned has at its lower end a toe which accurately fits inside of the chain link. Shoulders above this toe rest on the sides of the link and hold it flat against the base plate while the slanting position of the plunger tends to force the link toward the front of the machine and against the spring limiting device. The movement of the plunger itself takes place through a heavy spring so that each new link on the chain, as it is forced into place to receive the next link, is held between two springs, one tending to hold it back. The effect of this is to equalize any irregularity. This can best be understood by imagining an actual case where a link is 1/16 inch too long. If this link were shoved against a fixed stop, it would be 1/16 inch out of position. If it is, however, held between two springs, the error is taken up at both ends and the chances are that the opening into which the next link must fit is little, if any, out of true position.

The back side of the machine is shown in Fig 4. An ingenious device at the back of the machine provides for accurately locking the sprocket at each link space as it rotates. The ratchet device consists of two left-hand sprockets mounted in opposite directions and each having a spring dog engaging the teeth. When the chain is ready to be removed, one of these dogs is for an instant released thus allowing the chain sprocket to move the length of one link, when both dogs again lock against further movement in either direction. The cam shaft for ordinary 1-inch

pitch chain revolves at approximately 38 revolutions a minute, and at this speed 1-inch pitch chain is formed at the rate of 200 feet an hour, or approximately three times the rate of hand assembling.

Making chain out of castings of one form or another is one of the oldest methods known. Malleable iron chain is extensively used, first, because it lends itself so readily to special design and, second, because the first cost is low; being about one-fifth of that of steel chain for the same purpose. The lumber industry is probably the largest user of malleable detachable chain and in most lumber plants chain is used for moving the material in all operations from the initial hoisting of the log through to the finished lumber. In some cases transfer tables in lumber mills require a chain a mile or more in length, and the expense of this in steel chain would be considerably out of proportion to the life of the average lumber plant. The mining industry also is an exceptionally large user of malleable chain.

To Install Electric Heat Treating Furnaces

Several electric furnaces for heat treatment work are in the process of installation, according to the Electric Furnace Co., Salem, O., which is supplying the equipment. Two 100-kilowatt tool steel annealing furnaces are being placed in the plant of the Columbia Tool Steel Co., Chicago. These furnaces are especially adapted to the handling of long bars of tool steel in boxes, the temperature being controlled automatically. Special arrangements for slow cooling are provided for in these units and both furnaces are made to operate from one set of control apparatus. The furnaces are of the car type and include a number of special features.

Another installation for the Auto Strop Safety Razor Co., New York, consists of two furnaces adapted for the heating of lead baths through which razor blade steel is drawn for treatment. The first bath will be maintained at 1500 degrees Fahr. and the second bath at about 600 degrees Fahr. These furnaces are of the automatic type and are equipped with metallic resistors. The Metal & Thermit Corp. has purchased another furnace for its East Chicago plant. This furnace is of 200-kilowatt capacity and, excepting for its size, is a duplicate of one installed a year ago. It will be used for the special treatment of oxides, to be supported on a double fire-brick hearth. Hadfields, Ltd., Sheffield, Eng., are installing a 360-kilowatt, cartype electric furnace for the heat treatment of manganese steel castings. This unit is a duplicate of one made some time ago for the American Manganese Steel Co., Chicago, and excepting in size, is similar to the installation just being started at the Johnstown, Pa., plant of the Lorain Steel Co. for similar work.

Investigate Iron Mines Near Birmingham

The iron ore investigation being conducted at the southern experiment station of the bureau of mines, Birmingham-Tuscaloosa, Ala., has as its ultimate goal the solution of the problem of the utilization of the high silica ores of which there are large tonnages in the Birmingham district. The production as well as the concentration of the ores depends largely upon the costs, based upon conditions prevailing today, and meeting such conditions is the most difficult part of the work of the bureau.

The iron ore investigation is divided into several parts, each being worked upon as time permits. Aside from the concentration of the ores, methods of mining including support, ventilation, and drainage are being studied. Considerable work has already been done on mining methods and in the course of the next six months this should be practically completed. As a preliminary study to mine support, the crushing strength of the ore is being determined.

Nearly three dozen cubes of iron ore have been prepared and tested and the work will be extended to cover the region in which mining is being actively done.

The results of the crushing tests give a range 13,000 to nearly 18,000 pounds per square inch. The preliminary work was done to determine the best size of cubes to use in the tests, and it has been demonstrated that of the sizes tested the 4-inch cubes give the most satisfactory results. In later work 4 and 6-inch cubes will be used in testing for ultimate strength of ore. An average of all sizes from 1 to 4-inch cubes gave nearly 13,000 pounds per square inch, ultimate strength.

Some interesting results also were obtained relative to failure of test-pieces which should be of value when a study of failure of pillars is taken up underground.

Considerable progress has been made on experimentation on high silica ores with the magnetic deflection machine and table. Results are indicating fairly satisfactory separation and further refinement should greatly increase the percentage of extraction obtained. Extensive sizing tests on roll crushing have also been made together with tests by classifier on jig hutch products.

It is now planned to collect samples of iron ore for each foot from top to bottom of the big seam at regular intervals of 2 miles along Red mountain. Cubes will be prepared from the samples and tests made.

Surface Workings Are Studied

It is also planned to make a thorough investigation of failure of pillars and top-rock in all of the ore mines on Red mountain, and as a preliminary study, considerable work has been done and is being continued in the surface workings along

FIG. 6—MOLDING MACHINES ARE USED FOR MAKING UP THE MOLDS. METAL GATED PATTERNS ARE USED AS SHOWN

the outcrop. This work will be continued underground. Data relative to the subsidence of mine workings is also being collected.

Locker Makers To Attend Washington Meeting

Invitations to attend the meeting in Washington on Feb. 15 to consider standardization of steel lockers and the elimination of unnecessary sizes have been extended by the division of simplified practice, department of commerce, to the Van Dorn Iron Works and E. F. Hauserman Mfg. Co., Cleveland; Armor Clad Mfg. Co., Berger Mfg. Co., and Canton Art Metal Co., Canton, O.; All-Steel Equipment Co., Durabilt Steel Locker Co., and Lyon Metallic Mfg. Co., Aurora, Ill.; Hesse Warming & Ventilating Co. and Durand Steel Locker Co., Chicago; Hart & Hutchinson Co., New Britain, Conn.; Manufacturing Equipment & Engineering Co., Framingham, Mass.; Fred Medart Mfg. Co., St. Louis; Narraganset Machine Co., Providence, R. I.; Bernstein Mfg. Co., Standard Steel Equipment Co. and Edward Darby & Sons Co., Philadelphia; Dexter Metal Mfg. Co., Camden, N. J.; Terrell's Equipment Co., Grand Rapids, Mich.; Keighley Metal Ceiling Co., Pittsburgh; and Art-Metal Co., Jamestown, N. Y. The list will be enlarged.

Will Discuss Unification of Abbreviations

The American Engineering Standards committee has called a conference to be held at the Engineering Societies building, New York, Feb. 13, to determine whether unification of engineering abbreviations and symbols should be undertaken, and if so, what the scope of such work should be. Because of the peculiar character of the subject and the fact that some of the interested organizations will be unable to have representatives present, the standards committee has provided a questionnaire through which such organizations may send by mail, such information as they consider desirable for the consideration of the conference. It is stated that the need for standardization of abbreviations is great, since at the present time there is confusion in the use of many abbreviations and symbols. For instance, the expression "pounds per square inch," may be represented by at least a half dozen abbreviations. In England, for instance, "H.P." is used for "high potential," whereas in the United States it is generally used to mean "horsepower." These and many other symbols and abbreviations will be discussed.

The impartial board appointed by the Industrial Association of San Francisco to examine wages in the building trades has recommended that no reductions be made in the wage scale for 1923, as "there is no indication or any likelihood of sufficient lowering of the cost of living to warrant a decrease." Scheduled building operations of San Francisco for 1923 total $50,000,000, and it is said there will be a shortage of mechanics.

Melting Ferromanganese by Electricity

BY FRANK HODSON

STEELMAKERS now are generally agreed that it is desirable to make molten ferromanganese additions to open-hearth and converter steels rather than to add cold unmelted metal. Bessemer first recommended this practice, but it was a rather difficult operation until the advent of the electric furnace made it possible in a simple and efficient manner. Ferromanganese is not an easy alloy to melt and handle intermittently, thus undoubtedly it has been the difficulties with the melting equipment that has prevented wider use of molten manganese.

A properly designed electric arc furnace with bottom contact to insure circulation in the bath and a large bath area to permit of proper slag manipulation will solve many of the melting difficulties previously experienced and insure a supply of molten ferromanganese at a low operating cost. The effect of hot ferromanganese on steel either just before pouring or in the ladle is much more pronounced than when the cold alloy is added. In England, where several such furnaces have been operating for some time, and in Germany, where the complicated induction furnace with its low power factor is used for the same purpose, it has been found that the actual amount of ferromanganese used can be reduced 30 to 40 per cent. Coupled with this, the steels produced have been more free from gases, occluded oxides and slag, and the waste and rejections have been much less.

The saving in actual amount of ferromanganese added to the charge probably is due to the fact that when adding the molten alloy it is taken up entirely by the steel and no part of it is lost in the slag or remains undissolved. Also it has a greater deoxidizing effect than cold alloy and there is no cooling of the bath. No dissolving is necessary and if the molten ferromanganese is added in the ladle, the steel can be poured without loss of time.

Steels made by the addition of hot ferromanganese roll and forge more easily than when the alloy is added cold. It is safe to say that if 0.5 per cent manganese were the minimum amount required to enable a given steel to roll, probably if molten ferro were substituted 0.35 to 0.4 per cent would produce a steel that would roll easily. Besides a better quality of steel, a smaller amount of ferro, and an absence of melting loss, additional savings can be made by the use of manganese ore, inferior fines and low grade ferromanganese. All these can be used in the electric furnace. In experiments made on the Greaves-Etchells type of furnace which has the particular advantage of operation either entirely with top electrodes or with top electrodes and the whole of the furnace hearth, as much as 25 per cent of the charge was added in the form of manganese ore. The metallic melting loss rarely exceeded 3 per cent.

For proper metallurgical manipulation of ferromanganese, it seems highly desirable to use an electric furnace with a large open bath rather than a restricted channel as in the induction furnace, and also one in which there is a circulation from the bottom of the furnace. When top heat only was applied, it was found that the manganese had a tendency to segregate out and sink to the bottom where it would stick. When the bottom connection on the furnace was cut in, segregation ceased and the metal was uniform throughout in temperature and composition.

The voltage required on melting ferromanganese differs considerably from that required with steel and in order to maintain a steady arc, and if necessary to hold the furnace on lower power input, it is important to have a furnace in which each electrode operates independently and can maintain steady arcs with only 20 to 25 per cent of normal electrode load.

A furnace which has four electrodes, with one phase attached to the furnace hearth, giving slow circulation of metal from the bottom, is the most desirable for ferromanganese, or for any alloy or high grade steel.

The author is president Electric Furnace Construction Co., Philadelphia.

Way Cleared for Mining on Site of Hibbing

Duluth, Minn., Feb. 5.—The Oliver Iron Mining Co. has the right to conduct mining operations on the former site of Hibbing, Minn., according to a decision handed down by the United States Supreme Court. The suit against the mining company was started over a year ago by 72 property owners in the "north forty" to restrain the Oliver interests from commencing operations. In a previous decision, the supreme court of Minnesota refused to grant an injunction. The way is now clear for the Oliver company to arrive at a settlement with the remaining surface owners. Stripping operations may be started this year.

Increased activity is shown by all interests in mining operations on the Minnesota ranges. In the Nashwauk district contractors are preparing to start stripping at the Pearson mine. The Larue mine has received new machinery for its shop and a large electric shovel is about to be put to work in getting out ore.

A contract for a 7-mile extension from Nashwauk to Superior has been let by the Great Northern railway to Guthrie Bros., St. Paul, to facilitate the handling of ore coming to the Great Northern docks from the Nashwauk, Marble and Calumet districts.

Late News of the Societies

Notes on Past and Coming Meetings of National and Local Trade and Technical Organizations

ACCORDING to a recent announcement the annual meeting of the Electric Power club will be held on June 11 to 14 inclusive at the Homestead, Hot Springs, Va. The association was organized at this place in 1908. It is expected that a considerable amount of standardization work will be effected at this meeting since the new handbook will be published a short time thereafter.

* * *

Discusses Industrial Fuels

J. A. Doyle, furnace engineer of the W. S. Rockwell Co., spoke recently before the Connecticut section of the American Society of Mechanical Engineers at New Haven, Conn., on "Fuels for Industrial Heating Processes."

* * * *

Talks to Engineers

Calvin W. Rice, national secretary of the American Society of Mechinacl Engineers, spoke on "Engineering Societies of South America" before the American Institute of Electrical Engineers Tuesday, Jan. 30, at New Haven, Conn.

* * * *

Canadian Engineers Meet

The annual meeting of the Engineers Institute of Canada was held in Montreal, Jan. 24. In the course of an address on "The Relation of Engineering to the Industrial Question," President J. G. Sullivan strongly denounced the domination of professional labor agitators as a hinderance to prosperity in that they increased the cost of production and decreased the purchasing power. Dean C. J. Mackenzie of the University of Saskatchewan read a paper on "The Deterioration of Concrete in Alkaline Soils." It was announced that a past president fund had been established to provide medals for the best papers written on engineering subjects. Arthur St. Lawrent, chief engineer, public works department, Ottawa, was elected president.

* * *

Exhibit Film on Steelmaking

"The Story of Steel" in moving pictures was shown recently at Providence, R. I., by the Rhode Island branch of the Metal Trades association and the Employers' Association of Rhode Island. The picture showed the processes required in converting iron ore into steel.

* * * *

Discusses Fans in Mines

At the annual meeting of the mining section, Engineers' Society of Western Pennsylvania, held Tuesday evening, Jan. 30 in the blue room of the William Penn hotel, Pittsburgh, a paper was presented entitled "Application of Modern Fans to Coal Mines." It was read by J. R. Robinson, president of the Robinson Ventilating Co., Pittsburgh, who illustrated his paper with lantern slides showing various installations of ventilating fans in coal mining operations.

* * *

Metallurgist Speaks

At the regular monthly meeting of the Pittsburgh chapter of the American Society for Steel Treating, E. E. Thum, associate editor of the organization's *Transactions* and editor of *Metallurgical and Chemical Journal* delivered an addres on "The Training of the Metallurgist and Manager in Heat-Treating. The meeting was held in the William Penn hotel, Pittsburgh, Tuesday, Feb. 6.

Convention Calendar

Feb. 8-9—American Society for Steel Treating. Winter sectional meeting, City club, Chicago. W. H. Eiseman, 4600 Prospect avenue, Cleveland, is secretary.

Feb. 12-17—American Ceramic society, annual meeting, Pittsburgh. R. C. Purdy, Ohio State university, Columbus, O., is secretary.

Feb. 14-16—American Institute of Electrical Engineers. Mid-winter convention, New York. F. L. Hutchinson, 29 West Thirty-ninth street, New York, is secretary.

Feb 19-21—American Institute of Mining and Metallurgical Engineers. Annual meeting in Engineering Societies building, New York. F. F. Shrapleas, 29 West Thirty-ninth street, New York, is secretary.

April 3-7—American Chemical society. Spring meeting New Haven, Conn. L. Parsons, P. O. Box 1515, Washington, is secretary.

April 18-20—Society of Industrial Engineers. Spring convention in Cincinnati. The headquarters of the society are at 327 S. La Salle street, Chicago.

April 19-21—American Gear Manufacturers' association, annual meeting, Hotel Cleveland, Cleveland. T. W. Owen, 2443 Prospect avenue, Cleveland, is secretary.

April 25-27—National Foreign Trade Council. Annual convention in New Orleans. O. K. Davis, 1 Hanover square, New York, is secretary.

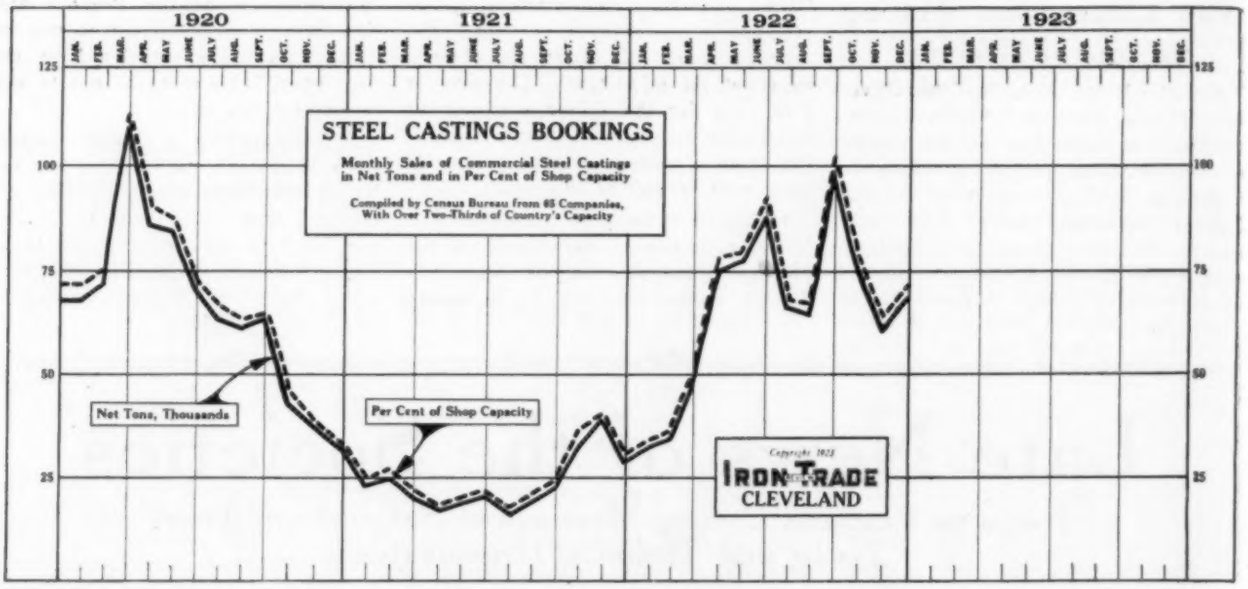
April 28-May 3—American Foundrymen's association. Annual convention and exhibition at Public Hall, Cleveland. C. E. Hoyt, 140 South Dearborn street, Chicago, is secretary.

May 3-5—American Electrochemical society, semiannual meeting, Hotel Commodore, New York. Colin G. Fink, 327 South La Salle street, Chicago, is secretary.

May 7-9—American Association of Engineers. Annual convention at Norfolk, Va. C. E. Drayer, 63 E. Adams street, Chicago, is secretary.

May 17-19—National Supply and Machinery Dealers association; Southern Supply and Machinery Dealers association; and American Supply and Machinery Dealers association, triple convention, Cincinnati. F. D. Mitchell, 1819 Broadway, New York, is secretary.

June 25-26—American Society for Testing Materials, annual meeting at the Chalfonte-Haddon hall hotel, Atlantic City, N. J. C. L. Warwick, 1315 Spruce street, Philadelphia, is secretary.


1920
1921
1922
1923
STEEL CASTINGS BOOKINGS
Monthly Sales of Commercial Steel Castings in Net Tons and in Per Cent of Shop Capacity
Compiled by Census Bureau from 65 Companies, With Over Two-Thirds of Country's Capacity
Net Tons, Thousands
Per Cent of Shop Capacity
IRON TRADE
CLEVELAND

Monthly Steel Castings Bookings Shown

BOOKINGS of commercial steel castings in the country, monthly data of which are being compiled by the bureau of census as announced in last week's issue of IRON TRADE REVIEW, are here presented for the first time, by months over a period of three years. In succeeding months the accompanying chart showing fluctuations in castings sales will be included each month in the Business Trend. The accompanying table shows the bookings of commercial steel castings for 1920, 1921, and 1922 as reported by 65 identical companies comprising over two-thirds of the country's total capacity of 96,000 tons monthly of which 38,300 tons usually is devoted to railroad specialties and 58,600 tons to miscellaneous castings.

Shipments Listed Through Greatest American Ports

Washington, Feb. 6.—On the basis of total inbound and outbound cargoes handled in the year ended June 30, 1922, the shipping board lists in their order the 15 greatest seaports of the United States: New York, New Orleans, Baltimore, Philadelphia, Port Arthur, Tex., Galveston, Tex., Baton Rouge, La., Boston, Norfolk, Va., San Francisco, Portland, Oreg., Seattle, Newport News, Va., Fall River, Mass., and Portland, Me.

In long tons, in the year ended June 30, New York handled 769,257 tons of ores and metals for export and 449,409 tons for import; New Orleans, 149,978 tons of metals and manufactures for export; Baltimore, 104,896 tons of iron and steel for export and 414,181 tons of ores and metals for import; Philadelphia, 41,513 tons of iron and steel for export and 133,719 tons of ores and metals for import; Norfolk, 5631 tons of iron and steel for export and 15,383 tons of ores and metals for export; Portland, Oreg., 2098 tons of iron and steel for import; Mobile, Ala., 65,657 tons of iron and steel for export; and Los Angeles 15,436 tons of iron and steel for import.

All available space in the Coliseum, Chicago, has been allotted by the National Railway Appliances association for its equipment exhibition to be held March 12 to 15. All firms desiring space have been accommodated and 162 exhibits will be presented.

	Total		Railway Specialties		Miscellaneous	
	Net Tons	Per cent Capacity	Net Tons	Per cent Capacity	Net Tons	Per cent Capacity
1920						
January	68,935	71.1	25,048	65.4	43,887	74.9
February	72,959	75.3	24,669	64.4	48,290	82.4
March	110,282	113.8	58,487	152.7	51,795	88.4
April	85,286	88.0	37,435	97.7	47,851	81.7
May	83,543	86.2	36,741	95.9	46,802	79.9
June	71,084	73.4	23,714	61.9	47,370	80.8
July	64,885	67.0	25,253	65.9	39,632	67.6
August	62,360	64.4	26,822	70.0	35,538	60.6
September	64,610	66.7	29,894	78.1	34,716	59.2
October	42,635	44.0	12,447	32.5	30,208	51.5
November	36,501	37.7	10,927	28.5	25,574	43.6
December	30,205	31.2	6,789	17.7	23,416	40.0
Total	793,305	68.2	318,226	69.2	475,079	67.6
1921						
January	24,679	25.5	5,964	15.6	18,715	31.9
February	25,209	26.0	9,942	26.0	15,267	26.1
March	20,903	21.6	6,173	16.1	14,730	25.1
April	17,726	18.3	4,795	12.5	12,931	22.1
May	18,622	19.2	6,369	16.6	12,253	20.9
June	19,381	20.0	7,350	19.2	12,031	20.5
July	15,785	16.3	4,673	12.2	11,112	19.0
August	18,539	19.1	6,870	17.9	11,669	19.9
September	23,435	24.2	10,032	26.2	13,403	22.9
October	32,961	34.0	17,605	46.0	15,356	26.2
November	40,522	41.8	20,726	54.1	19,796	33.8
December	29,912	30.9	14,389	37.6	15,523	26.5
Total	287,674	24.7	114,888	25.0	172,786	24.6
1922						
January	34,459	35.6	20,081	52.4	14,378	24.5
February	37,080	38.3	18,578	48.5	18,502	31.6
March	47,892	49.4	23,791	62.1	24,101	41.1
April	75,665	78.1	46,560	121.6	29,105	49.7
May	77,600	80.1	42,796	111.7	34,804	59.4
June	89,365	92.2	51,694	135.0	37,671	64.3
July	66,166	68.3	32,372	84.5	33,794	57.7
August	63,416	65.4	21,843	57.0	41,573	70.9
September	97,919	101.1	56,781	148.3	41,138	70.2
October	75,709	78.1	34,276	89.5	41,433	70.7
November	60,899	62.8	22,131	57.8	38,768	66.2
December	68,889	71.1	28,271	73.8	40,618	69.3
Total	795,059	68.4	399,174	86.9	385,885	56.3

Obituaries

DAVID REEVES, president of the Phoenix Iron Co., died at his home in Phoenixville, Pa., Feb. 6. He was 71 years of age, having been born March 27, 1852, and although he had been in ill health for some time, his death was unexpected. He was elected to the presidency of the Phoenix company 24 years ago, succeeding his father, Samuel J. Reeves, who in turn had succeeded his father, David Reeves, the first prsident of the company. Mr. Reeves was educated at Rensselaer Polytechnic institute, Troy, N. Y., and in 1872 was graduated with the degree of civil engineer. He immediately entered the bridge building business in 1872 with the firm of Clarke, Reeves & Co., with which firm he continued for 12 years. In 1878 he was elected president of the Phoenix Iron Co., which position he held until his death. In 1884 he was elected president of the Phoenix Bridge Co. In addition to these business connections he was a director of the Cambria Iron Co., of which company his father was an organizer. He was a member of the American Society of Civil Engineers, the American Iron & Steel institute, and several other business and social organizations.

William B. Crafts for 43 years associated with Wetherell Bros. Co., Cambridge, Mass., wholesale steel jobbers died at his home in Brookline, Mass., recently.

John Armstrong, president of the Armstrong Bros. Tool Co., Chicago, died Jan. 28 at Chattanooga, Tenn., while on his way by automobile to Florida to join his family.

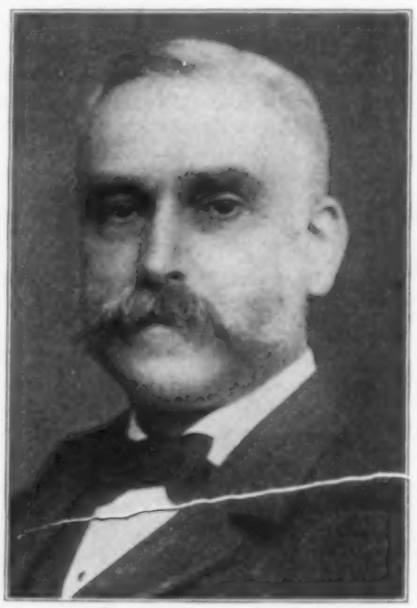
Harry W. Hand, former president of William Cramp & Sons Ship & Engine Building Co., Philadelphia, and before that connected with the I. P. Morris Co., Philadelphia, died suddenly Jan. 26. He was 64 years old.

Elisha H. Wilcox, 72 years old, manager of the Boston Office of the Grinnell Co., Inc., Providence, R. I., with which company he had been connected in various capacities for more than half a century, died at his home in Auburn, R. I., Jan. 28.

F. H. Wheeler, founder and president of the F. H. Wheeler Mfg. Co., Chicago, manufacturer of protective apparel, recently died. He was 62 years old. He had relinquished active management of his business to his son, E. L. Wheeler, two years ago.

William James Metcalf, assistant to the president of the Yale & Towne Mfg. Co., Stamford, Conn., died of pneumonia Jan. 29. He had been connected with the company since 1902 and for many years was in charge of the company's Philadelphia office. He was 44 years old.

George Edwin Turner, aged 55, president and treasurer of the Turner-



DAVID REEVES

Fricke Mfg. Co., Pittsburgh, gas engines, died Feb. 1 at his home. He was born in Lockport, N. Y., and attended Cornell university, graduating in 1893. He had lived in Pittsburgh since 1900.

John Warren Sargent, an expert designer and builder of stationary engines and junior member of the former Rice & Sargent Engine Co., Providence, R. I. died in a hospital in that city, Jan. 30. He was 67 years old. He established the business in Providence in 1895. He retired several years ago to engage in research work. He was a member of the American Society of Mechanical Engineers.

John Theodore Anderson, superintendent and general manager of the Davenport Foundry & Machine Co., Davenport, Ia., died Jan. 28. He was 56 years old. He had been connected with the Davenport company for 32 years, having been one of its organizers. For the past 25 years he had been superintendent and general manager. He was born in Christianople, Sweden, in 1866, and came to America in 1884. He learned the machinist trade at the Barnard & Leas Co., Moline, Ill., then went to Davenport to join the Bettendorf Axle Co. Later he went to the Davenport Machine & Foundry Co.

William P. Waugh, consulting engineer for the H. H. Robertson Co., Pittsburgh, died recently at his home in Sewickley, Pa. He was well known through his work in the development of skylights and the solution of ventilation problems in many of the country's greatest industrial plants and public buildings. He attended Iowa State college, and upon leaving school took up railroad construction work. From this he became connected in other phases of construction work including the St. Louis water works tunnel under the Mississippi river and the construction of the Chicago drainage canal. For 12 years he was sales manager in the New York district for the James G. Wilson Mfg. Co., which position he left some time before joining the Robertson company.

David Cochrane, inventor, designer and builder of the open-feed water heater which bears his name died Jan. 24. He was born in Scotland in 1850 and in his early years worked as a patternmaker on the Clyde. In 1879 he came to the United States where he entered the employ of Ferris & Miles. Shortly afterward he became connected with the Harrison Safety Boiler Works, Philadelphia, which now is known as the H. S. B. W. Cochrane Corp. He frequently was consulted concerning the design of steam plants and his great contribution to steam engineering consisted in focusing attention upon the more efficient utilization of exhaust steam for heating buildings and for heating and purifying water to be used for feeding boilers and for industrial purposes.

An issue of $1,500,000 6½ per cent first mortgage serial coupon bonds of the Bullard Machine Tool Co., Bridgeport, and Fairfield, Conn., has been purchased by F. W. Straus & Co., New York city. The bonds mature in from two to 15 years, and will be offered at par.

Jones & Laughlin Income Report Is Compiled

Earnings of the old Jones & Laughlin Steel Co., Pittsburgh, for 1922 amounted to $10,580,983, after payment of taxes, according to a bulletin issued by the Pittsburgh stock exchange from statements supplied by officers of the company. The surplus of the new corporation on Jan. 1, 1923, was $24,384,619 and the balance sheet showed outstanding capital of $120,000,000, equally divided into preferred and common stocks. The company has been succeeded under the new organization by the Jones & Laughlin Steel Corp. Following is the first consolidated income account of the Jones & Laughlin Steel Co., and subsidiary companies published:

Surplus Jan. 1, 1922	$110,914,870
Net after taxes	10,580,983
Less interest	1,140,611
Less: Depreciation and depletion	4,026,469
Operating profit	5,413,902
Add: Adjustment of surplus account of 5400 shares of stock for 10,800 shares preferred and 10,800 common stock of Jones & Laughlin Steel Corp.	1,620,000
Profit from treasury operation	20,230
Total profit	7,054,135
Less dividends	2,919,750
Balance	4,134,385
Surplus Dec. 30, 1922	115,049,255
Less: Adjustment in connection with settlement with employe shareholders	664,636
Final Surplus	114,384,619
Capital stock Jones & Laughlin Steel Co.	30,000,000
Total capital and surplus	144,384,619
Capital stock Jones & Laughlin Steel Corp.	120,000,000
Surplus	24,384,619

The company's balance sheet shows a total value for real estate, plants, mines, steamships, rolling stock, etc., of $105,214,040. Current assets amount to $66,641,245 and with net quick liabilities of only $5,981,503, the net working capital is $60,659,742. The company reports cash of $7,810,851 and inventories of $24,428,495.

Witherow Steel Co. Will Double Capacity

The capacity of the Witherow Steel Co., Pittsburgh, will be more than doubled as a result of improvements and extensions of facilities now being planned. The company has merged with the River Front Land Co. under the name of the Witherow Steel Co. The capital stock has been increased to $2,800,000 preferred and 10,000 shares of common, no par value. In addition Dilworth, Porter & Co., have bought an interest in the company and is equipping one of its mills to roll under contract with the Witherow Steel Co., the sections developed and patented by the latter company. The directors of the new corporation are as follows: W. P. Witherow, G. H. Flinn, William Flinn, J. C. Dilworth, F. C. Stoeltzing and W. P. Snyder, Jr. Officers are as follows: W. P. Witherow, president; Geo. H. Flinn, vice president; Joseph Dilworth, secretary, and W. C. Watt, treasurer. Otherwise the personnel of the reorganization remains the same.

Involves Large Sum

Net financing by the Youngstown Sheet & Tube Co., for the purpose of acquiring the Steel & Tube Co. of America and the Brier Hill Steel Co., will involve between $30,000,000 and $50,000,000, it is understood. The purchase of the Brier Hill Co. will be accomplished by an exchange of stock. Details of the other transaction have not been made public. At a recent meeting directors of the Steel & Tube company approved the sale of their property. Two of the 19 directors opposed the deal but no action to prevent the sale is expected to be taken by stockholders.

To Sell Blast Furnace

The Woodstock Operating Corp., LaFollette, Tenn., of which L. C. Crewe is president and general manager, is offering for sale the property of the Woodstock Iron & Steel Corp. This includes a 250-ton blast furnace at Anniston, Ala., with complete equipment, a 225-ton ore sintering plant at the same place; iron ore mines with equipment at Cedartown, Ga., and Rendalia, Ala., and several thousand acres of ore and other mineral lands. The Anniston furnace has not been in operation since 1920.

Settles With Goverment

Merchandise creditors of the bankdupt Lincoln Motor Car Co., purchased a year ago by Henry Ford for $8,000,000 will receive less than 50 cents on the dollar as result of an agreement between the government and the receiver on the former's claim for profits on the contracts for Liberty motors held by the Lincoln company. The government agreed to accept $1,550,000 although its original claim was in excess of $9,000,000.

Of the purchase price for the property $3,000,000 was paid out through the United States district court for prior claims. The receiver, the Detroit Trust Co., is holding $5,000,000 remaining of the purchase money and with $1,550,000 now to be paid the government there remains $3,450,000 to meet the claims of nearly 1000 creditors including the expenses of receivership. These claims approximate $7,351,554. The stockholders of the company will not receive anything.

Prices Higher

On Sulphate of Ammonia—Light Oil Distillates Demand Up

New York, Feb. 6.—As a result of improved demand, principally from the Orient, prices on sulphate of ammonia have stiffened. On business for domestic account the market is now holding around $3.15 to $3.20, plant and for export, $3.55 to $3.60 port, in double bags. Production is being well maintained at around 80 per cent and were it not for shortage of labor this figure would probably be higher. Producers generally are pretty well booked into May.

An encouraging feature in the coal tar by-products market the past few days has been an increased industrial demand for light oil distillates. Prior tc that, industrial demand for some time past had been limited, and while present trading is still hardly satisfactory to sellers, it nevertheless has shown a substantial improvement. Prices remain unchanged as follows: Pure benzol, 27 cents in tanks and 33 cents in drums; toluol, 30 cents in tanks and 35 cents in drums; solvent naphtha, 27 cents in tanks and 32 cents in drums; pure xylol, 30 cents in tanks and 35 cents in drums; and commercial xylol, 26 cents in tanks and 34 cents in drums.

Although buying in naphthalene for spring requirements has been completed in many cases, there is still a fair inquiry which probably as the cleaning season draws near, will be increased, a number of last minute commitments usually being placed. Flakes are unchanged at 6 to 7 cents, f.o.b. works, and balls at 7 to 8 cents. Phenol is being booked in fair volume at around 24 cents, producers' plants.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plants in Tank Lots

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producres' Plants

Phenol	$0.24
Naphthalene, flake	0.06 to 0.07
Naphthalene, balls	0.07 to 0.08

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	$3.15 to $3.20

Contract

Pure benzol	$0.30
Toluol	0.30
Solvent naphtha	0.27
Commercial xylol	0.29

Per Pound at Producers' Plants

Phenol	$0.24
Naphthalene, flake	0.06 to 0.07
Naphthalene, balls	0.07 to 0.08

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields

PERCIVAL CHRYSTIE, elected president of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., at a recent meeting of the board of directors, as noted in the Feb. 1 issue of IRON TRADE REVIEW, succeeds the late Knox Taylor. Mr. Chrystie formerly was vice president and has been acting president of the company since Mr. Taylor's death. As president of the Taylor-Wharton Iron & Steel Co. he will head the company's subsidiaries, which are the William Wharton Jr. & Co., Inc., Easton, Pa.; the Tioga Steel & Iron Co., Philadelphia and the Philadelphia Roll & Machine Co., Philadelphia. Mr. Chrystie was born in High Bridge. He attended the local school and later Leal school, Plainfield, N. J., and Turner's academy, Pittsfield, Mass. He started to work for the Taylor-Wharton company as an office boy during his school vacations and later went to work in the shops from which he progressed to the position of inspector. He then was transferred to the sales department and introduced the use of manganese steel in the anthracite coal regions of Pennsylvania. Returning to the plant he became superintendent of the steel foundry, then secretary and treasurer of the company and finally vice president, which position he held until his recent appointment. His selection as president comes after more than 30 years service with the company. He is a member of the American Iron & Steel institute, of the American Institute of Mining & Metallurgical Engineers, and of various social and professional organizations.

Samuel M. Buck, works manager of the High Bridge plant of the Taylor-Wharton Co., has been elected a director to fill the unexpired term of Knox Taylor, former president. Mr. Buck will represent the employe stockholders.

J. Warren Ijams resigned as president of the Inland Malleable Iron & Steel Co., Terre Haute, Ind., at a recent stockholders' meeting, and was succeeded by B. A. Scott of Detroit. Mr. Ijams resigned in order to give more of his attention to other business interests. He, however, will continue to retain his financial holdings in the company.

J. C. F. Yarnell, who has been appointed Michigan representative for the Western Drop Forge Co., Marion, Ind., as noted in the Jan. 25 issue of IRON TRADE REVIEW, still represents the Clark Bros. Bolt Co., Pittsburgh, the new representation being simply an additional account he has taken as manufacturers' agent.

W. M. Hall has been named manager of the Los Angeles office recently opened by W. A. Taylor, Pacific Coast manager for the Wheeling Steel Products Co., Wheeling, W. Va. Mr. Hall formerly was connected with the San Francisco office, and prior to that with the La Belle Iron Works, Steubenville, O.

PERCIVAL CHRYSTIE

W. E. Mills has been elected vice president and general manager of the Hadfield-Penfield Steel Co., Bucyrus, O. As general manager he succeeds R. C. Penfield who resigned that position. Mr. Penfield, did not sever his connection with the company, however, as in the future his activities will be devoted to the interests of the American Equipment Co., a subsidiary organization.

F. L. Hunt, chief engineer of the Turner Falls Power & Electric Co., Turner Falls, Mass., was elected vice president of the Western Massachusetts Engineering society at a recent meeting of the executive committee. He succeeds E. E. Lochridge, who recently was elected president of the society. A. L. Bausman of the National Equipment Co. was elected to the executive board.

Secretary of Labor James J. Davis and Prof. F. C. Caldwell of the department of electrical engineering, Ohio State university, have been named directors of the Eye Sight Conservation Council of America. Secretary Davis and Prof. Caldwell will act with leading engineers, educators, state and federal officials, economists and civic leaders in carrying on a nationwide plan to conserve vision in industry and education.

L. W. Allen has been elected president of the Kansas City Bolt & Nut Co., Kansas City, Mo., succeeding Solomon Stoddard, who has been made chairman of the board. Mr. Allen until recently was vice president and general manager of the Laclede Steel Co., St. Louis, and prior he was president of the Valley Steel Co. which was absorbed by the Laclede company in 1918. George T. Cook, who has served for some time as chairman of the board of the Kansas company, has been elected chairman of the executive committee.

P. D. Brown has been appointed general sales manager of the Poldi Steel Corp. of America, New York, succeeding George H. Grundy, whose resignation was noted in the Jan. 25 issue of IRON TRADE REVIEW. Mr. Brown, for some time past has been acting in the capacity of district manager of sales at Baltimore for the company, and for many years prior to that was manager of the Baltimore branch of the Crucible Steel Co. of America. L. C. Gosselin has been named assistant general sales manager of the Poldi company, and Thomas J. McAndrew has been placed in charge of the Baltimore branch.

Emil Pollak, for many years president of the Pollak Steel Co., Cincinnati, has been elected chairman of the board of directors. He is succeeded as president by Maurice E. Pollak, former vice president. Julian Pollak has been re-elected vice president, while Charles Judah was re-elected treasurer and made a member of the board to fill the vacancy caused through the retirement of Bernard E.

Pollak. D. E. Sawyer, general sales manager of the company has retired from that position and has made no announcement concerning his future activities.

William G. Abbot, formerly in charge of the statistical department of the Consolidated Steel Corp., New York, has been appointed research director of the National Foreign Trade council, New York.

L. V. Walsh, for 20 years treasurer and general manager of sales of the Pittsburgh Shovel Co., Pittsburgh, has resigned that position, and C. B. Steffy, since 1917 secretary of the company, has been appointed general manager of sales. He also continues as secretary.

William S. Thomson has resigned as vice president and general manager of the H. D. Smith Co., Plantsville, Conn. He was connected with the firm for the past 18 years.

A. B. Barber, Portland, Oreg., who since 1919 has been technical advisor to Poland, has been made manager of the department of transportation and communication of the chamber of commerce of the United States, at Washington. He succeeds J. R. Bibbins, who is returning to private engineering practice.

Irwin B. Laughlin, formerly of Pittsburgh but now residing in Washington has been nominated by President Harding as a regent of the Smithsonian Institute. He will succeed to the place made vacant by the death of Alexander Graham Bell.

E. P. Cadwallader has been placed in charge of the recently opened sales office at 18 West Thirty-fourth street, New York, of the H. E. Marks Corp., Pittsburgh. T. R. Galey has been placed in charge of the company's office at 703 Harrison building, Philadelphia, which also was recently opened.

Thomas Stewart, formerly foundry superintendent of the Lakey Foundry & Machine Co., the Clover Foundry Co. and the Muskegon Castings Co., all of Muskegon, Mich., and the Interstate Foundry, Cleveland has been appointed superintendent of the Foster Machine Co., Elkhart, Ind.

Ted Martin recently manager of the Maynard Steel Castings Co. and previously connected with the George H. Smith Steel Casting Co., both of Milwaukee, has been made manager of the Farrell-Cheek Steel Foundry Co., Sandusky, O.

A. H. Spalton has been appointed joint managing director of Henry Bessemer & Co., steelmakers, Sheffield, and Bolton, England. Mr. Spalton, who has been secretary of the Bessemer company for many years, has also been elected a member of the board of directors. He has been associated with the Bessemer interests in England for 20 years.

Frank A. Vanderlip, who has been chairman of the board of directors of the American International Corp. since the company was formed during the war, has resigned all his connections with the company. At the same time the resignation of Charles A. Stone as president is announced. Mr. M. C. Brush, senior vice president, was elected chairman of the executive committee and president, and Gordon H. Balch, vice president.

I. L. Houghton has been made vice president and general manager of the United States Malleable Iron Co., Toledo, O. Mr. Houghton was with this firm six years ago and since that time he has been identified with various interests including the Maumee Malleable Castings Co. which firm he organized and of which he was president. He has disposed of his holdings in the latter company.

S. R. Mitchell has been appointed vice president and general manager of the Walworth Ohio Co., Cleveland, a subsidiary of the Walworth Mfg. Co., Boston, which recently took over the business of the Hiram Rivitz Co., Cleveland. Mr. Mitchell has been connected with the Walworth interests for the past 29 years starting as an office boy he has held positions with the company as manager of the western division, manager of the branch house department and manager of the Kewanee works.

Christian W. Lynch has been elected president and a director of the Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., to fill the vacancy caused through the resignation of Alfred K. Barker. Up to last year Mr. Lynch was president and general manager of the Harrisburg Foundry & Machine Co., Harrisburg, Pa., and prior to that for many years was president and general manager of the W. O. Hickok Mfg. Co., Harrisburg. He is actively identified with several leading financial institutions of Harrisburg.

B. L. Worden has been elected vice president and a director of the Cutler-Hammer Mfg. Co., Milwaukee, to fill the vacancy created through the resignation of A. W. Berresford, noted in the Feb. 1 issue. Mr. Worden was the organizer and president of the Worden-Allen Co., Milwaukee, and the Lackawanna Bridge Co., Buffalo, which interests he recently disposed of. During the war he was general manager of the shipbuilding department of the Submarine Boat Corp., the shipyard at Newark bay being built under his supervision. At present he is president and general manager of the Beaver Board companies.

E. J. Rights has resigned as erection engineer of the Shoemaker Satterthwaite Bridge Co., Pottstown, Pa.

M. Kessler has been appointed general manager of the Athol Machine & Foundry Co., Althol, Mass., to succeed H. R. Linton. Mr. Kessler has had an extensive machine shop experience. Previous to 1914 he was general foreman of the machine shop of A. E. Meyers Co., Pittsburgh. When this company was sold to the Standard Steel Car Co. in 1915 he remained with the new company in the position of superintendent. The latter part of 1915 he went to the Westinghouse Electric & Mfg. Co., Pittsburgh, as general foreman of a department producing 8-inch British shells. Later he was placed in charge of the production of moveable parts for the Browning machine gun at Springfield, Mass. In 1919 he accepted a position as general superintendent of the company in Athol with which he is still connected.

Alexander S. Blanc, formerly agent in San Francisco for the Consolidated Steel Corp. until its recent dissolution, has become connected with the Milton Pray Co. and will represent it in Seattle and the Northwest.

Dr. Martin Costa, chief structural engineer of the Central Railroad of Brazil, has established himself at Pittsburgh as a representative of the Brazilian government and will inspect steel turned out by the American Bridge Co., at Ambridge, Pa., for a bridge to span the Parana river in Brazil. More than 10,000 tons of steel will be necessary for the bridge.

Arthur H. Nelson has been appointed line agent for the Matlack Coal & Iron Co., Inc., 44 Beaver street, New York, in the northern New Jersey territory. At the recent annual stockholders' meeting of the company, Howard C. Matlack was re-elected president; A. F. Kempe, vice president, and G. Walter Bates, secretary and treasurer. Sinclair Carr of Mann, Macneal & Co., Ltd., London agents for the Matlack company now is in this country.

George J. Heitzler, has resigned as secretary of the National Brass Mfg. Co., Cincinnati, to become affiliated with the United States Finance Co. as manager.

Marcus L. Foster, who recently resigned as treasurer of B. D. Whitney & Son, Inc., Winchendon, Mass., sailed Jan. 28, for a seven months' trip abroad.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

SINCE Feb. 1 the business and property of the Hiram Rivitz Co. Cleveland, has been conducted by the Walworth Ohio Co., a subsidiary of the Walworth Mfg. Co., Boston. The property includes a modern warehouse and pipe shop, a large pipe storehouse and a warehouse and store in Youngstown, O. These latter will be operated from the company's headquarters in Cleveland. A complete stock of valves, fittings and tools, as well as plumbing supplies, heating and factory supplies will be carried at the Cleveland warehouse and will be duplicated on a smaller scale at the Youngstown plant. S. R. Mitchell is vice president of the new company, and will be in active charge, while William M. Mickleborough is assistant treasurer.

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CONTRACT has been placed with the Link-Belt Co., Chicago, by the Inland Steel Co., Indinaa Harbor, Ind., to rebuild a belt conveyor at the latter's coke plant, which was damaged by fire some time ago. The fire completely destroyed the 300-foot incline belt conveyor and gallery which formerly handled the coal from the crusher house to the mixer house. The conveyor was installed in 1913 by the Link-Belt Co., and in the 9 years it has been in operation, it has handled approximately 3,500,000 tons. The Morava Construction Co. has the contract to do the structural work on the rebuild conveyor.

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TO meet the largely increased demand for safety deposit boxes, steel filing equipment for vaults, and other metal furniture specialties, the Invincible Metal Furniture Co. of Manitowoc, Wis., at its annual meeting authorized the immediate expenditure of about $75,000 for a 2-story building, 90x200 feet. Upon its completion the machine shop, steel shears and presses will be moved from the present plant, and an equal amount of new machinery of this kind added. The space thus released will be used for additional enameling ovens, painting sprays, polishing machines and general finishing and storage. A short time ago a complete plating shop was installed. The improvement contemplates a 100 per cent increase in output. The production of vault doors will be largely increased. E. W. Anderson is factory manager.

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INTERESTS identified with the Pennsylvania Rubber & Supply Co., 2819 Prospect avenue, Cleveland, have organized the Cleveland Universal Parts Co., which purchased and now is operating in the plant of the Peters Machine & Mfg. Co., 7320 Madison avenue, Cleveland. Officers of the new company are: President, J. C. Hipp; vice president, Thomas J. Smith; secretary, E. R. Seager and treasurer, H. G. Smith.

* * *

NEW annealing facilities, costing in excess of $100,000, are being provided by the South Side Malleable Casting Co. of Milwaukee, of which Walter W. Lange is president and general manager. Contracts have been let for a building, 175 x 250 feet, adjacent to the present shops at Fourteenth and Windlake avenues. H. A. Kroening & Co., 893 Layton boulevard, are the general contractors.

* * *

THE American Engineering Co., Philadelphia, manufacturer of stokers and marine auxiliaries, has taken over the Standard Crane & Hoist Co., and the patent and manufacturing rights to the monorail electric hoist with the low headroom, formerly made by the Standard company. H. S. Valentine, chief engineer of the latter organization, with 20 years experience in the design and manufacture of hoists, will direct sales and supervise the manufacture for the new producer. The American company has reorganized its No. 1 plant to accommodate the work of building and testing the hoists.

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PLANT additions estimated to cost $75,000 are planned by the Harvey Spring & Forge Co. of Racine, Wis., which recently doubled its capital stock, which now is $300,000. It specializes in automobile springs, both for manufacturers and for replacement purposes.

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C A. PARSONS & Co., Newcastle-on-Tyne, England, have received an order from the Commonwealth Edison Co., Chicago, for a 40,000-kilowatt turbo-alternator. This machine is to be installed in the Crawford avenue power station at Chicago, the aggregate capacity of which is to be about 500,000 kilowatts. The consulting engineers are Sargent & Lundy, Chicago, and Merz & McLellan, London.

* * *

ENLARGEMENT of the main works of the Simmons Co. at Kenosha, Wis., to provide a department manufacturing steel dressers, bureaus, dressing tables, chairs and other chamber furniture is planned. Between $750,000 and $1,000,000 will be spent for new buildings and machinery to place the furniture line on a quantity production basis. Principal contracts have been let. Purchases are now being made of a large lot of equipment, including pressing, punching, polishing, welding and forming machinery, ovens, etc.

* * *

E I. DU PONT DE NEMOURS & Co., Inc., operating a large plant at Barksdale, near Washburn, Wis., has completed plans for the construction of a 2000-foot concrete dock for accommodating lake vessels at the Washburn plant, located on the shore of Chequamegon bay, Lake Superior. The dock will be equipped with an electric railway and conveyor system to handle nitrates and other materials from vessels to plant. Work will start about April 1. A depth of 23 feet is provided for the dock.

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MANUFACTURE of files and rasps will be engaged in on an extensive scale by the Milwaukee File & Rasp Co., Milwaukee, which recently was incorporated with a capital stock of $30,000. Incorporators of the company are Henry F. Seefeld, Clarence Seefeld and George A. Seefeld.

* * *

AT A special meeting of the board of directors of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., when Percival Chrystie, vice president, was elected president of the company, succeeding the late Knox Taylor, the following were named directors: William Selfridge, Theodore H. Banks, William Ziegler Jr., William C. Dickerman, vice president of the American Car & Foundry Co.; H. B. Ayres, general manager of the H. K. Porter Co.; E. E. Marshall, president of the American Manganese Mfg. Co.; L. W. Francis, president of Witherbee-Sherman Co.;

George E. Patterson, vice president of the General Electric Co.; Mr. Chrystie; Victor Angerer, vice president of the Taylor-Wharton Iron & Steel Co. and S. M. Buck, works manager of the Taylor-Wharton company.

* * *

ADVICES have been received from the Michigan Drop Forge Co., Pontiac, Mich., to the effect that the recent fire at its plant was inconsequential. It is confined entirely to the boiler house, according to B. F. Esgar, president. Damaged equipment has been repaired.

* * *

ANNOUNCEMENT has been made by the Wilson Welder & Metals Co., 132 King street, New York, to the effect the Mine & Smelter Supply Co., with branch offices in Denver, Salt Lake City and El Paso, Tex., has taken over the exclusive representation of the Wilson company's plastic arc-welders and welding metals, in Colorado, Utah, Nevada, Wyoming, New Mexico and Western Texas.

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JOSEPH T. Ryerson & Son, Inc., Chicago, an Illinois corporation with $4,200,000 authorized capital, as taken out a Wisconsin charter. The company recently acquired the assets of the Conradson Machine Tool Co., Green Bay, Wis., and W. A. Morey, in charge of the plant, was named its Wisconsin agent in its articles of incorporation. The company is capitalized at $61,314 in Wisconsin.

* * *

A. FINKL & Sons Co., 1326 Cortland street, Chicago, has purchased about 100,000 square feet of property adjoining its plant, and will start work immediately on the erection of a factory addition. This will consist of a modern forge plant for the production of forged and heat treated die blocks and piston rods. The present plant will continue the production of alloy and plain carbon steel forgings up to 20,000 pounds.

* * *

MAX GREENHUT, president and treasurer of the L. N. & N. Foundry Co., 2088 Scranton road, Cleveland, recently purchased the plant and assets of the defunct Collinwood Foundry & Machinery Co., and plans to operate the latter plant at 1704 Waterloo road, Cleveland. The Collinwood company's plant and property, including machinery and tools, were purchased of F. J. Pekoc Jr., receiver, for $52,000.

* * *

ELECTION of officers was held at the annual meeting of the Cutler-Hammer Mfg. Co., Milwaukee, held Jan. 25. F. R. Bacon was elected president; F. L. Pierce, vice president and treasurer; B. L. Worden, vice president; T. E. Barnum, secretary; H. F. Vogt, comptroller; W. C. Stevens, general sales manager; H. J. Wiegand, manager of operations; J. C. Wilson, assistant to the president and N. S. Hopkins, director of purchases.

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THE scrap metal business conducted at Sheboygan, Wis., for many years by Gustave Holman, has been incorporated as the H. & B. Iron & Metal Co., with a capital stock of $20,000. Mr. Holman has admitted as partners, Julius Balkansky, A. Locke and David Balkansky.

* * *

FIRE of unknown origin recently damaged the plant of the Hercules Steel Casting Co., 875-881 Robinson avenue, Milwaukee. The damage was fully covered by insurance. A pattern shop and storage shed will be erected by the company and the building now utilized for these purposes, will be rebuilt for administration purposes.

* * *

BERT HARRIS & Co., 233 Broadway, New York, has been organized with $100,000 capital, to deal in iron and steel scrap. The company succeeds the firm formerly known as Burt Harris and has purchased the scrap yards of the Empire State Steel Products Co., Jersey City, N. J. Officers are: President, Burt Harris; vice president, M. D. Adleson, formerly head of the Empire company and secretary and treasurer, E. P. Harris.

* * *

TO ENABLE it to care for its growing business, the Reading Machine & Tool Co., Reading, Pa., an established business, recently was incorporated with $75,000 capital stock. It will continue as manufacturers' agents and jobbers of metal and woodworking machinery, etc. Officers of the company are: President, William H. Kaufmann; vice president, Adolph Kaufmann and secretary and treasurer, George F. Kaufmann. Offices of the company are at 437 Washington street, Reading, Pa.

* * *

FULL operation has been attained by the Brown Steel Co. department of the Columbus Mill & Mine Supply Co., Columbus, O., in its new plant which was completed recently. The plant consists of a warehouse, structural yard and fabricating shop, and is served by the New York Central and the N. & W. railroads. The warehouse is 50 x 305 feet, the structural yard, 75 x 400 feet and the fabricating shop 60 x 305 feet. All are under one roof and equipped with electric traveling cranes. The shop is fully equipped with gate and angle shears, punches, riveters, friction saw and each tool is served by jib or wall cranes. The company now is accumulating stock and it is its intention to serve Columbus, O., and immediate vicinity. Will F. Brown is president.

* * *

STOCKHOLDERS of the Perfection Hoist & Engine Co., Two Rivers, Wis., have decided to liquidate the assets of the company, and are selling the buildings, machinery and other equipment. The company was organized in Milwaukee and moved to Two Rivers two years ago. It never entered actual production, although a factory was built and equipped with modern machinery. The company planned to manufacture mechanical hoists, engines, farm lighting plants, etc.

* * *

ELECTION of officers was held at the recent meeting of the Wilcox, Crittenden & Co., Inc., Middletown, Conn. The officers elected are: President, W. W. Wilcox; vice president, Frances A. Beach; secretary and treasurer, H. C. Whittlesey; assistant treasurer, George A. Palmer; assistant secretary, Ernest L. Gibbons, and directors, W. W. Wilcox, Francis A. Beach, H. C. Whittlesey, Edward S. Moury and Leroy C. Wilcox. The latter two are new members of the board

* * *

REORGANIZATION of the Columbus Machine Co., Columbus, O., which includes a merger of the Reading Valve Co., was effected recently and the capitalization of the company has been increased to $300,000. A new plant will be erected at Mt. Vernon avenue and Burr street, Columbus, two stories, 97 x 100 feet. New machinery and equipment will be installed as soon as the structure is completed. Hydraulic steel valves and all kinds of pipes and fittings are manufactured by the company. Officers are: President, J. F. Horton; secretary, A. R. Holmes and treasurer and general manager, C. P. Reading.

* * *

CAPITALIZED at $1,000,000, the Ohio-Kentucky Fluorspar & Lead Corp. recently was organized under a Delaware charter, and will operate mines at Smithland, Livingstone county, Ky., where it is understood to control 800 acres of mineral land. Its main office will be in Youngstown, O. Judge James B. Kennedy, chairman of the Brier Hill Steel Co., Youngstown, is president of the new organization and other officers are: Vice president, F. B. Moodie and secretary-treasurer, Warren Williamson. Adolph Boehme, engineer of the Youngstown Sheet & Tube Co., Youngstown, O., also is prominently connected with the new company.

Active Buying

Of Refractories Continues—Chrome Brick Orders Are Heavy

Pittsburgh, Feb. 6.—Buying of refractories in fairly large quantities continues and producers are endeavoring to confine their obligations to the first quarter. Various buyers are presenting requirement orders, however, which not always are accepted at the present price levels because, from their size, it is known that they are for requirements subsequent to April 1. A few sellers, however, report no inclination on the part of their customers to stock heavily against future needs and they are confining their purchases to immediate requirements. Various lots of fire clay and silica brick are reported booked by different producers, involving 50,000 to 500,000 brick at a time. One recent order for silica brick for new construction came from the Columbia Steel Co., Pittsburg, Cal., and called for 500,000 brick; an order likewise was placed for a proportionate amount of fire clay brick.

Refractories

FIRE CLAY BRICK
(Per 1000 f.o.b. works)

Pennsylvania, No. 1	$43.00 to 46.00
Pennsylvania, No. 2	38.00 to 41.00
Ohio, No. 1	40.00 to 42.00
Ohio, No. 2	36.00 to 38.00
Illinois, No. 1	43.00 to 46.00
Illinois, No. 2	40.00 to 42.00
Kentucky, No. 1	40.00 to 42.00
Kentucky, No. 2	36.00 to 38.00
Missouri, No. 1	38.00 to 40.00
Missouri, high grade	48.00 to 50.00
Maryland, No. 1	45.00 to 48.00
Maryland, No. 2	35.00 to 42.00

SILICA BRICK

Pennsylvania	$42.00 to 44.00
Chicago	47.00 to 49.00
Birmingham	48.00 to 50.00

MAGNESITE BRICK
(Per Net Ton Seaboard Base)

9 x 4½ x 2½	$65.00

CHROME BRICK
(Per Net Ton)

9 x 4½ x 2½	$50.00

Price cutting still is noted although it appears to be less prevalent in connection with silica than it has been in recent weeks. While it is reported that as low as $38 has been done in this vicinity, that price appears no longer available and the producer naming it is understood now to be asking $40. One or two who have been quoting $40 have gone to $42 which is considered the minimum of the regular market. In Chicago the minimum has been $46, with the regular market quoted at $47.

Operations among fire clay and silica brick makers are averaging 70 to 80 per cent, while in chrome and magnesite, operations are practically full. Demand is particularly good for chrome brick in lots of 25,000 to 100,000 brick at a time. One interest took orders in January for in excess of 250,000 chrome brick which is one of the largest months in its history. This brick continues quotable at $50 seaboard base. Several customers who bought practically no chrome brick before late 1922, are reordering indicating its substitution for magnesite brick. Notwithstanding this fact, several small orders for magnesite continue to be ordered from time to time at $65, seaboard base.

Reduction in Accidents Is Shown by Corporation

New York, Feb. 6.—In the United States Steel Corp.'s annual safety sanitation and welfare bulletin just issued, it is stated that serious and fatal accidents in the operations of all of the subsidiary companies have been reduced 56.13 per cent since 1906, when accident prevention work was begun. Since that time, 35,313 men have been saved from serious or fatal injury, and since 1912 disabling accidents, which include any accident causing loss of time greater than the balance of the working term, have been reduced 71.41 per cent. This means that a total of 193,232 men have been saved from injury.

During the first six months of 1922, 136 plants, mines and other operations with an average employment of 55,639 men went through an entire month without one disabling accident.

At present subsidiary companies of the corporation maintained 389 completely equipped emergency stations, and 13 base hospitals have been constructed by the subsidiary companies, some of which compare in size with public hospitals. Proper sanitation facilities, the bulletin says, have been installed at all plants and mines. Sixty restaurants and lunchrooms now are in operation, and others are planned. Subsidiary companies now employ 71 visiting nurses.

An idea of the facilities afforded for recreation for employes is conveyed by the fact that there are 109 tennis courts and 125 fully equipped athletic fields with baseball diamonds, running tracks and amphitheatres in or near the plants of subsidiary companies. Numerous clubhouses have been constructed for employes, and subsidiary companies have provided 175 playgrounds for the children of employes. The bulletin also shows the extent of the functioning of the employe stockholder plan, the home owning plan, housing facilities and educational work carried on by the company.

Pension Disbursements Are Increased

New York, Feb. 6.—The twelfth annual report of the United States Steel and Carnegie Pension Fund just released shows total disbursements for 1922 of $1,266,661.47. This is by far the largest amount on record and compares with $947,879.15 for 1921, the previous largest total. In the distribution of the pension payments, the Carnegie Steel Co. has the largest total with $311,154.15. The American Steel & Wire Co. comes next with $236,816.94. The American Sheet & Tin Plate Co. takes third place with $162,915.37. The National Tube Co. is fourth with $129,385.02.

Last year 745 pensions were added and 296 were discontinued, making a total of 3886 continued beyond Dec. 31, 1922. The average age of pensioners is 66.28 years and the average range of service 31.39 years. The average monthly pension from 1911 to 1923 inclusive, has been $25.75.

Nonunion Membership Contract Upheld

Employers in Massachusetts regard the decision rendered recently by the supreme court of that state in the case of the Moore Drop Forging Co. against the Springfield central labor union as one of the most important judicial determinations ever made affecting their interests. The court has followed the same line of reasoning as have those in other states where the issue has been passed upon; namely, that employers may make it a condition of employment that employes refrain from membership in trade unions, and that employers may enjoin third parties from attempted interference.

All employes of the Moore company were members of a union, and the company requested them to sign contracts, requiring them to give up their membership. The employes who refused to sign were discharged, and others struck, and all combined to carry on various activities against the company. Later the company filled all the places of those discharged or on strike, and when operations became normal the Springfield central labor union took up the conflict. This union was enjoined, and the court decided that an employer had an unqualified right to prescribe the terms upon which it would hire its employes.

The Draper Corp., Hopedale, Mass., has given its employes who received less than 45c an hour an increase in wages of 5c an hour.

Machinery Inquiries Growing

Current Orders Are Confined to Single Tools, but Prospective Business Looms Large as Inquiries Continue To Come Out—Few Large Lists Are Pending —Railroad Purchases and Inquiries Are Limited

INQUIRY for machine tools and shop equipment is growing at a fair rate. While large inquiries are few and scattered the small single tool requests are exceptionally numerous, and the volume of business in prospect through such orders alone is enormous. However, there appears to be considerable hesitancy on the part of most inquirers, in closing on their needs and as a result the market is not exceptionally active judged from a selling standpoint.

Orders from the railroads are not large although several of these interests have fair inquiries current. The New York Central within the past few days entered the market for a quantity of tools, while another eastern road also put out a list.

Throughout the Middle West the automotive industry is furnishing a fair amount of orders as are the parts manufacturers. However, this demand is below normal despite the apparent need of many such manufacturers to replace old and worn-out equipment. Few large inquiries are current from the manufacturing trade, practically all being of the single tool character. In Wisconsin a number of projects are under way which will involve considerable expenditures for equipment. These include the erection of additions to the plants of the Simmons Co., Kenosha, Wis., and the Hamilton-Beach Co., Racine, Wis. In California considerable activity has been noted of late.

Crane and allied equipment orders are on a par with those of a week ago. Nothing large has been noted, practically all the business being of small orders. New inquiries are not numerous. However, action on a number of the lists which have been current for some time is expected soon. Due to rising labor costs prices on some lines of cranes and hoists are stronger. However, as yet the market is dull and some quoted prices can be shaded on a fair order.

More Railroad Tool Inquiries Placed Current

NEW YORK, Feb. 6.—Inquiries have been issued by the New York Central railroad for about 20 machine tools for installation at its various plants. The equipment includes one 26-inch, four 16-inch, and five 18-inch engines lathes, three planers, a radial drill and a shear. The New York, New Haven & Hartford railroad is inquiring for some equipment, including a radial drill, a planer and a milling machine. Demand generally, however, is light and with the possible exception of a sizable order placed recently by the Union Tank Car Corp. for some replacement equipment for its repair shops at Lima, O., there has been little buying of consequence.

The market for conveying equipment has been fairly active. A dozen or so crane orders have been placed, and there appears to be a rather good demand for tramrails, hoists and the lighter equipment for use in warehouses,

Crane Awards and Inquiries of the Week

Orders Placed

One 3-motor 35-ton, electric traveling crane with 44-foot span for the Richardson Scale Co., Athenia, N. Y., to the Northern Engineering Works, Detroit.

One 2-motor, 5-ton, electric traveling crane with 45-foot span, for the Semi-Steel Casting Co., St. Louis, to the Northern Engineering Works.

One 3-motor electric traveling crane with 27-foot span for the Michigan Stove Works, Detroit, to the Northern Engineering Works.

Two 3-ton and three 5-ton for the Fay & Egan Co., Cincinnati, to the Pawling & Harnischfeger Co., Milwaukee.

One 200-ton locomotive hoist for Boston & Maine railroad, to Whiting Corp.

One 10-ton handpower crane, 18-foot span, for Greenfield Light & Power Co., Turner Falls, Mass., to Whiting Corp.

Two 2-ton handpower cranes, 15-foot spans, for installation at Bogota, N. J., to New Jersey Foundry & Machine Co.

One 30-ton trolley for Chester, Pa., plant of American Locomotive Co., to Shaw Electric Crane Co.

Two 15-ton trolleys for the Shenango works, American Sheet & Tin Plate Co., to the Morgan Engineering Co., Alliance, O.

Pile driver for Buffalo, Rochester & Pittsburgh railroad, to Industrial Works.

One 40-ton locomotive crane, equipped with bucket for the Western Asphalt Paving Co., to the Industrial Works.

One 25-ton locomotive crane for the John F. Casey Co., to the Industrial Works.

One 60-ton electric overhead crane for the Phoenix Utility Co., 71 Broadway, New York City, to Whiting Corp.

One 25-ton electric crane, 32-foot span, for the Great Northern Paper Co., Anson, Me., to the Milwauee Electric Crane & Mfg. Co.

One 10-ton electric crane, 32-foot span, for the Eastman Kodak Co., Rochester, N. Y., awarded to unnamed builder.

Two 10-ton electric cranes for Anaconda Copper Mining Co., 25 Broadway, New York, for installation at Raritan, N. J., to the Shaw Electric Crane Co.

One 35-ton electrc crane, 44-foot span, for the Richardson Scale Co., Athenia, N. Y., to the Northern Engineering Works.

Two 40-ton electric cranes for the Magma Copper Co., Ariz., to Shaw Electric Crane Works; one 15-ton and two 10-ton handpower cranes to Cyclops Iron Works.

One 3-ton motor bridge crane for Pacific Sanitary Mfg. Co., Richmond, Cal., to Cyclops Iron Works.

One 5-ton traveling crane for National Lead Co., Melrose, Cl., to Milwukee Electric Crane Co.

One 5-ton, 95-foot radius, hammerhead type lumber handling crane for the port of Grays Harbor to the Star Iron & Steel Co., Tacoma.

Orders Pending

Cranes for Dravo Contracting Co., Pittsburgh; early action expected.

Twelve handpower cranes, including several of one and two tons capacity, pending in the New York City district.

One 10-ton electric crane for Carolina Steel & Iron Co., Greensboro, N. C., pending.

One 10-ton crane with 42-foot span for the Franklin Steel Works, Franklin, Pa.; bids being taken.

Three 2-ton 3-motor traveling cranes, with 30-foot span, for the Lancaster Steel Products Co., Lancaster, Pa.; bids being taken.

One 10-ton trolley for the Laughlin works, American Sheet & Tin Plate Co.; bids being taken.

One 65-ton gantry wth 45-foot span and one 60-ton standard electric crane with 44-foot span, for the Phoenix Utility Co., 71 Broadway; bids asked.

One 2-ton, 2-motor crane, 18-foot span for Pittsfield, Mass., plant of the General Electric Co., Schenectady, N. Y., bids asked.

One 20-ton electric crane, 40-foot span, for the Columbia Granite Co., Westerly, R. I.; either new or used.

One 10-ton used electric crane, 42-foot span, for the Franklin Steel Works, Franklin, Pa., pending.

One 40-ton and one 5-ton overhead traveling crane for the Southern California Edison Co., of Los Angeles.

One 5-ton traveling crane for W. S. Wetenhall & Co., San Francisco.

and factory lofts. One inquiry is before the market here for 12 handpower cranes, practically all of light capacity. Prices are slightly stronger, due chiefly to advancing labor costs.

Numerous Tool Inquiries Pending

CLEVELAND, Feb. 6.—Demand for machinery during the past week has not been as brisk as a week ago. Numerous inquiries are in the market but closing action on most of them is being delayed. Considerable trading is being done by users, who in this way are ridding their plants of considerable equipment for which they have no use and in exchange obtaining machines which are needed to increase their production schedules. In this way they are obtaining needed tools without investing additional capital. During the week a New York interest purchased 30 punch presses from the Bowen Products Co., this city. This was the largest transaction noted. However, single tool orders have been fairly numerous, particularly to the automotive interests.

While inquiries are numerous they are not large. A Detroit manufacturer is understood to be inquiring here for a considerable amount of equipment. The Pressed Steel Car Co., McKees Rocks, Pa., wants four car wheel boring mills and a number of axle lathes. A drill press and a lathe is wanted by L. McPhail, 207 East Broad street, Columbus, O., while another Columbus, O., interest is in the market for a turret lathe, a drill press and several other tools. It is understood the Invincible Metal Furniture Co., Manitowoc, Wis., plans to erect an addition and will enter the market shortly for shears, presses and other equipment, including enameling ovens, polishing machines, etc. Additional machinery now is being installed by the Burlington Brass Works, Burlington, Wis., while the Simmons Co., Kenosha, Wis., is purchasing presses, punches, polishing, welding and forming machinery, for a plant addition which it plans to erect.

There is but little buying being done by the railroads in this district, and for that matter there are practically no inquiries from these interests current here. However, a number of the tool manufacturing interests here are working on railroad inquiries which have been issued in other centers. No doubt some of this business will be taken by local builders. Tool building shops are steadily increasing production, although the betterment in demand is forging ahead slowly. General metalworking shop operations are gaining daily and this is expected to be reflected in a demand for machinery for replacement purposes. Machine tool prices are strong and further advances are expected. However, secondhand machinery prices still are weak, due to the fact considerable surplus machinery still is available through auction sales, etc., although the market to a great extent has been cleared of most of the good used tools.

Prospective Demand Is Encouraging

MILWAUKEE, Feb. 6.—The time is now believed close at hand when the manufacturers of lathes, planers, milling machines and other metalworking machinery are to be favored by more than the limited amount of business which has been coming to them on the basis of late. Manufacturers of metal products of all kinds are fast reaching the point where present capacity is being strained. With numerous projects of size coming out, and factory machinery in excellent demand, there cannot help being a reflection of this activity into the business of building tools with which to make machinery as well as metal products.

One of the largest projects is the establishment of a large steel bedroom furniture plant as an addition to the main steel bedstead works of the Simmons Co., at Kenosha, Wis. The Hamilton-Beach Co. at Racine, making electric drills, grinders, beverage-mixers, carpet washing machines, etc., plans a $200,000 addition. A $100,000 power plant will be built by the Patton-Pitcairn paint and varnish works in Milwaukee, and several other important steam plants are coming out. An 8000-horsepower hydroelectric plant is in prospect in northern Wisconsin, for the Wisconsin Public Service Co. Public garage construction is being resumed. Steel, iron and brass foundries in several parts of Wisconsin are doing extensive new work.

Tool Inquiry Still Growing

TORONTO, Ont., Feb. 6.—Increased inquiry features the machinery market. Orders closed during the week showed a slight improvement over those of previous week, but demand has not yet reached the volume expected by dealers. Live prospects continue to appear and many prospective buyers around the end of last year, have started to purchase. A fair sized list is being prepared by the Toronto Transportation commission, for lathes and general equipment for car shops. The Ford Motor Co. of Canada, will require considerable equipment for its plants, now under construction, at Ford, Ont., and at Tortonto, Ont. Mining equipment has shown considerable stregth during the past two or three weeks, and a number of good sales were reported on this account. Pulp and paper companies are preparing to spend millions of dollars on plant additions and equipment. Equipment for woodworking plants, lumber and planing mills is in active demand. Automotive companies are increasing their equipment buying and in fact practically all lines of industry are showing more readiness to enter the market for machinery, than has been the case for the past year or two.

Bids will be received by the Public Utility commission, Whitby, Ont., W. J. Luke, chairman, until Feb. 22, for the supply of centrifugal pumps, motors, gasoline engines, etc. for waterworks system. The Electroplax Co. Toronto, Ont., will require equipment for a new plant to be erected at Mount Dennis, Ont., for manufacture of electrical supplies and equipment. Cutten & Foster, Church street, Toronto, Ont., will purchase equipment for a factory addition. The London Shipping Containers, Ltd., London, Ont., will shortly be in market for equipment for a plant addition. The Brantford Brass Foundry, Ltd., Brantford, Ont., plans to triple the capacity of its plant and will install considerable equipment. The Quebec Development Co., Quebec, Que., will shortly enter the market for equipment for a proposed power plant.

Tool Demand Exceeds Expectations

SAN FRANCISCO, Feb. 2.—Demand for machine tool and allied equipment during the past month has been better than was anticipated and exceeds business of a year ago by at least 50 per cent. The outstanding feature of the market recently has been the great increase in the number of inquiries. The general tone of the market is strong.

Included in recent sales was a planer sold by Louis G. Henes to the San Francisco Harbor commissioners, a crank shaft grinder for an Eureka lumber interest sold by the Smith-Booth-Usher Co., and a 36-inch planer for the Premier Machinery Co. Eccles & Smith report the sale of a 20-inch radial drill and a lathe to the Mt. Diablo high school. This same company recently sold a lathe with accessories to a New Zealand interest. Berger & Carter sold a lathe to the Coos Bay Lumber Co., a 4-foot radial drill to the Union Lumber Co., a combination punch and shear to a Klamath Falls interest and a lathe and a 2½-foot radial drill to the Stockton high school. Harron, Rickard & McCone report the sale of a lathe, a cutter and tool grinder and some sheet metalworking tools to the Eureka high school.

On the large inquiry the Columbia Steel Corp. only four tools were purchased. Herberts Machinery & Supply Co., secured the order for a heavy duty engine lathe, Niles-Bement-Pond Co. a 73-inch boring mill and Pratt & Whitney a 2-inch bolt cutting machine and a hack saw. The Columbia Co. bought a secondhand 6-foot radial drill and it is understood action of the 600-pound steam hammer, 24-inch shaper and 24-inch crank slotter has been deferred indefinitely.

The Pacific Fruit Express Co. has purchased a forging machine, nut tapper and a bolt cutter. The Southern Pacific Co. also purchased a bolt cutter. The Chico high school will open bids Feb. 6. for a 9 and 16-inch lathe, a 16-inch shaper, a drill press, a hacksaw and a grinder. It is understood that action will be taken shortly on the list issued by the city of San Francisco for the Hetch Hetchy project.

Prospective crane business is bright as regards awards from hydroelectric companies. In addition new industries and plant enlargements promise fair business.

Improvement in Demand Noticeable

CHICAGO, Feb. 6.—Conditions in the machine tool market are improved though it is difficult to point out the definite sources from which the improvement comes. Total sales each month show an improvement. More shoppers are looking at equipment in machinery showrooms and the larger volume of inquiry seems to be of better quality than in the fall as the percentage of sales to inquiries is larger. Sales are of miscellaneous single tools from a variety of sources, both manufacturing and jobbing shops. Larger users are not taking lots, though they are buying single tools from time to time. Railroads are not in the market with the exception of the Santa Fe, which has not yet placed the four tools inquired for 10 days ago. Prces are unchanged, though strong and tending upward.

Inquiries Continue Fairly Numerous

PITTSBURGH, Feb. 6.—Inquiries for machine tools and equipment continue fairly numerous although considerable hesitancy to close still is encountered. The Westinghouse Electric & Mfg. Co. is understood to have made some purchases on its list, which with supplementary inquiries for its various plants, now comprises around 80 items. The National Tube Co. makes intermittent purchases for Gary, Ind. So far as reported, however, neither the McClintic-Marshall Co. nor the Pressed Steel Car Co. have commenced to buy on the lists referred to in this column in the past two weeks. The McClintic company is asking for several machine tools and some rivet-making machinery. The Pressed Steel Car Co. wants gate shears, axle lathes, car wheel boring mills, etc. Several verbal orders have been placed for used machinery but the dealers are awaiting confirming orders before details are given out. The Somers, Fitler & Todd Co., Pittsburgh, however, reports that the past week has been the best in about three years. Among the orders it has booked are several calling for two motor-driven punches and shears; two large milling machines, two woodworking machines, one 6-spindle drill, one motor-driven cutter and tool grinder, and two small lathes.

The American Sheet & Tin Plate Co. has closed on two of its three crane trolleys, and a few new crane inquiries are out. Several crane orders pending for several weeks still are held in abeyance. A few more crane and machine tool orders are scheduled to be placed within the next week or so.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

East of the Mississippi River

ANNISTON, ALA.—The Independent Soil Pipe Co. has been incorporated with $75,000 capital stock by S. W. Cater, R. B. Carr and R. T. House, and has taken oven the plant of the Ajax Foundry Co.

BIRMINGHAM, ALA.—The McWane Cast Iron Pipe Co., which is building a plant in North Birmingham, has increased its capital stock from $100,000 to $200,000. J. R. McWane is president.

GADSDEN, ALA.—Evan J. Owen and associates have leased the old Fullington Foundry here and will operate it under the name of the Ajax Foundry Co.

TALLADEGA, ALA.—The Talladega Pipe Co. plans improvements to its plants. E. O. Norman is superintendent.

NEW BRITAIN, CONN.—The Stanley Works, Myrtle street, has awarded a contract for an addition, 60 x 100 feet.

CHICAGO—The Chicago Form Clamp Co., 1935 Milwaukee avenue, has been incorporated with $2500 capital stock by George B. Bosco, Leo Michael, and Lester M. Thielen. The company is represented by Leo Michael.

CHICAGO—The Peoples Gas Light & Coke Co., 122 South Michigan avenue, plans a meter shop.

CHICAGO—The Super Range Co. has increased its capital stock from $50,000 to $200,000.

CHICAGO—The Auto Radiator Specialty Co., 4852 West Madison avenue, plans a 1-story auto repair and service shop, 25 x 75 feet.

CHICAGO—Thompson Neaylon, care of A. Epstein, 2001 East Pershing road, is having plans drawn for a factory and machine shop to cost about $35,000.

CHICAGO—The Burnside Steel Co., 1300 East Ninety-second street, has let contracts for a 1-story foundry building, 60 x 124 feet to cost about $15,000.

CHICAGO—The Delta Star Electric Co., 2437 Fulton street, has let a contract for a 1-story plant building, 103 x 109 feet, to cost about $40,000.

CHICAGO—The Public Safety Cap Co., 565 Fulton street, has been incorporated with $50,000 capital stock to manufacture metal caps, etc., by H. H. Adams, C. T. Morse, W. A. Stattman and others. The company is represented by C. T. Morse, 1528 Tribune building.

CHICAGO—The Robbins Machinery & Supply Co., 444 West Grand avenue, has been incorporated with $25,000 capital stock by Alfred W. Bays, Joseph Foran and H. P. Robbins. The company is represented by Alfred N. Bays, 111 West Washington street.

CHICAGO—The Chicago Oxwelding Corp., 2613 South State street, has been incorporated with $25,000 capital stock by I. N. Matcher, Otto Matcher, and H. W. Heitz. The company is represented by Heitz & Witlauf, 190 North State street.

ELIZABETHTOWN, ILL.—The Elizabethtown Power & Light Co. has incorporat-

THE WEATHER:
Cloudy Tonight, Tomorrow
Little Temperature Change

The Detroit News NIGHT EDITION

The Detroit Journal

THURSDAY, DEC.

STEEL PRODUCTION IS AT HIGH LEVEL

Trade Position Best in Two Years, Says Review.

CLEVELAND, O., Dec. 28.—Iron Trade Review today says: Iron and steel producers are entering 1923 with well filled order books, with prices better stabilized than in several months and with operations at 80 to 85 per cent of capacity. All this represents the industry in its best position in at least two years. Miscellaneous manufacturing consumers of steel, covering a wide variety of production, generally are estimating their requirements for the first quarter on an increased scale. This fact, joined with the continued heavy buying of freight cars by the railroads, the promising outlook in the building industry and the improving situation in the agricultural districts, is causing a more confident feeling concerning the future and its prospects.

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CLEVELAND

The international reputation and the World-wide circulation of the IRON TRADE REVIEW is the result of year after year of unfailing Editorial accuracy and reliability.

PROOF—

THE IRON TRADE REVIEW

"The Most Widely Quoted Trade Paper In The World"

Warehouse Steel Prices

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.215c
Buffalo	3.25c
Chicago	2.95c
Cincinnati	3.10c to 3.25c
Cleveland	3.06c
Detroit	3.00c
New York	3.19c
Philadelphia	3.15c
San Francisco	3.40c
Seattle	3.60c
St. Louis	3.05c
St. Paul	3.05c
Los Angeles	3.50c

IRON BARS

Boston	3.215c
Buffalo	3.10c
Chicago	2.95c
Cincinnati	3.10c to 3.25c
Detroit	3.00c
New York	3.19c
Philadelphia	3.15c
St. Louis	3.05c

SHAPES, STRUCTURAL

Boston	3.315c
Buffalo	3.35c
Chicago	3.05c
Cincinnati	3.20c to 3.35c
Cleveland	3.16c
Detroit	3.10c
New York	3.29c
Philadelphia	3.25c
San Francisco	3.40c
Seattle	3.60c
St. Louis	3.15c
St. Paul	3.15c
Los Angeles	3.60c

PLATES

Boston	3.315c
Boston 3/16-inch	3.04c
Buffalo	3.35c
Chicago	3.05c
Cincinnati	3.20c to 3.35c
Cleveland	3.16c
Detroit	3.10c
Detroit 3/16-inch	3.30c
New York	3.29c
Philadelphia	3.25c
Philadelphia, ¼-inch	3.47c
San Francisco	3.50c
Seattle	3.60c
St. Louis	3.15c
St. Paul	3.15c
Los Angeles	3.75c

NO. 10 BLUE ANNEALED SHEETS

Boston, 3/16-inch	4.215c
Buffalo	4.05c
Chicago	4.00c
Cincinnati	4.00c
Cleveland	3.65c to 3.76c
Detroit	3.95c
New York	4.19c
Philadelphia	3.85c
San Francisco	4.50c
Seattle	4.85c
St. Louis	4.10c
St. Paul	4.25c
Los Angeles	4.70c

NO. 28 BLACK SHEETS

Boston	5.40c
Buffalo	4.85c
Chicago	4.85c
Cincinnati	4.75c
Cleveland	4.25c
Detroit	4.65c
New York	4.80c to 4.90c
Philadelphia	4.60c
San Francisco	6.05c
Seattle	5.85c
St. Louis	4.95c
St. Paul	5.10c
Los Angeles	6.10c

NO. 28 GALVANIZED SHEETS

Boston	6.40c
Buffalo	5.85c
Chicago	5.85c
Cincinnati	5.75c
Cleveland	5.25c
Detroit	5.65c
New York	5.80c to 5.90c
Philadelphia	5.75c
San Francisco	6.90c
Seattle	6.85c
St. Louis	5.95c
Los Angeles	6.90c

BANDS

Boston	4.40c
Buffalo	4.05c
Chicago	3.70c
Cincinnati	3.85c to 4.00c
Cleveland	3.86c
Detroit	3.80c
New York	3.99c
Philadelphia	3.95c
San Francisco	4.05c
Seattle	4.35c
Los Angeles	4.40c

HOOPS

Boston	4.90c
Buffalo	4.35c
Cleveland	3.86c
Detroit	4.20c
New York	4.59c
Philadelphia, 1 inch and wider	
20 gage and heavier	4.25c
Seattle	5.00c

COLD ROLLED STEEL

Boston (rounds	4.15c
Boston (shapes	4.65c
Buffalo (rounds)	4.10c
Buffalo (shapes)	4.45c
Chicago (rounds)	3.95c
Chicago (shapes)	4.45c
Cincinnat (rounds)	3.90c
Cincinnati (shapes)	4.40c
Cleveland (rounds)	3.90c
Cleveland (shapes)	4.40c
Detroit (rounds)	3.95c
Detroit (shapes)	4.45c
New York (rounds)	4.05c
New York (shapes)	4.55c
Philadelphia (rounds)	4.00c
Philadelphia (shapes)	4.50c
San Francisco (rounds)	5.00c
Seattle (rounds)	5.25c
Los Angeles (rounds)	5.10c

ed with $20,000 capital stock by George W. Ledbetter, E. L. Robinson, Earl T. Galloway, Earl C. Gaines and E. F. Wall Jr. The company is represented by James A. Watson.

MASON CITY, ILL.—The Rotary Spreader Co. has been incorporated with $25,000 capital stock to manufacture machinery, tools, etc., by W. E. Ainsworth, C. A. McHarry, S. D. Sutton, and E. G. King. The company is represented by W. E. Ainsworth.

MT. VERNON, ILL.—The Mt. Vernon Mfg. Co. plans to rebuild its foundry which recently was damaged by fire.

ROCKFORD, ILL.—The Rockford Cabinet Co. Twelfth street and Ninth avenue, plans a 4-story addition.

AUBURN, IND.—The Elkhart Motor Car Co. is having plans drawn for a plant building.

AUBURN, IND.—The Sterlite Foundry & Mfg. Co. has been organized with $275,000 capital stock by J. A. Rendel, R. J. Schweitzer, G. C. Emmerick, M. S. Litchty, Charles W. Ruchel, A. L. Kuhlman and Raymond Stiteler.

EAST CHICAGO, IND.—The Bates Expanded Steel Trust Co. plans a plant to cost about $100,000.

EVANSVILLE, IND.—The Evansville Structural Supply Co., 215 First avenue, plans a 1-story fabricating plant, 80 x 100 feet, to cost about $27,000.

FT. WAYNE, IND.—C. Miller, 115 Broadway, plans a 2-story factory building to cost about $30,000. It will be devoted to sheet metalworking.

INDIANAPOLIS—The Millspaugh & Irish Corp. plans extensions to its plant. It manufactures automobile bodies.

MARION, IND.—The Marion Valve Lathe Co. has been organized with $5000 capital stock by Jacob Kilse, James W. Baugher and Earl Baugher.

SOUTH BEND, IND.—The Studebaker Corp. is having plans drawn for a 6-story factory building, 100 x 875 feet.

SULLIVAN, IND.—The Vigo Mining Co. plans a 1-story power house, 55 x 80 feet, to cost about $85,000.

ASHLAND, KY.—The Norton Iron Works is erecting a foundry building, 47 x 200 feet.

ASHLAND, KY.—The Ashland City Metal Products Co. has incorporated with $25,000 capital stock by R. R. Peebles, J. L. Neehan and C. S. Peebles.

LOUISVILLE, KY.—The Highway Signal Co. has been incorporated with $50,000 capital stock by E. W. Carter, George M. Grubbs and Tracey Girdler.

MARION, KY.—The Big Four Fluorspar & Ore Co. plans a mining and milling plant at an estimated cost of $100,000.

AUGUSTA, ME.—The Thompson Oil & Mines Development Co. has been incorporated to operate coal, iron, copper and other mines with $100,000 capital by D. A. Leland, R. W. Farris, E. M. Hill and others.

BALTIMORE—The L. E. Jones Wire & Iron Works, 321 North Calvert street, plans a plant addition to cost about $45,000.

BALTIMORE—The Maryland Meter Works plans a 1-story addition to its plant. Edmund S. Dickey is general manager.

BALTIMORE.—The Klimis Electro-Products 359 Calvert building, has been incorporated with $100,000 capital stock by A. K. Klimis, G. Blotakis and D. D. Panos.

CUMBERLAND, MD.—The American Cellulose & Chemical Co. plans the erection of a plant near here.

BOSTON—The A. E. Hunt Steel Co. has been incorporated to deal in iron and steel products with $30,000 capital by A. Ellis Hunt, Newtonville, Mass., Wheaton B. Byers, Lexington, Mass., and Thomas L. Kirkpatrick, Medford, Mass.

GARNER, MASS.—The O. W. Siebert Co., it is understood, plans to erect a plant in the spring. It manufactures children's vehicles, etc. O. W. Siebert is president of the company

TAUNTON, MASS.—The Metalcraft Co. has been incorporated to make metal products with $10,000 capital by Everett Bellamy, Raoul D. LaFrance, Lester Cohen and Joseph Cohen.

UXBRIDGE, MASS.—The Uxbridge Worsted Co. plans a power plant.

DETROIT—The Cadillac Brass & Mfg. Co., 4734 Bellevue avenue, plans to double its factory space and in other ways increase its business. It recently was incorporated with $40,000 capial stock.

GRAND RAPIDS, MICH.—The Litcher Electric Co., 41-43 Market street, plans a 3-story factory building.

JACKSON, MICH.—The P. & C. Nut Co. has let a contract for a factory building.

JACKSON, MICH.—The Reynolds Spring Co. is having plans prepared for two 2-story plant additions, 130 x 140 feet, and 100 x 130 feet, to cost $160,000.

MARSHALL, MICH.—The plant of the Marshall Furnace Co. recently was damaged by an explosion.

Bourne-Fuller Service

includes immediate shipment of all Iron and Steel materials from Cleveland and Cincinnati

Warehouses

If you are not receiving our Stock-list we shall be glad to send it to you regularly upon request.

Upson Works

Open Hearth Steel Bars for special uses. Also a complete line of Bolts and Nuts. Prompt Shipments.

THE
BOURNE-FULLER CO.
Iron, Steel
Pig Iron
Coke

CLEVELAND

New York **Chicago** **Detroit**
San Francisco
Cincinnati

RIVER ROUGE, MICH.—The Ford Motor Co. is reported considering a 1-story foundry.

BELLEVILLE, N. J.—Work will be started soon on the erection of a plant for the Westinghouse Lamp Co.

NEWARK, N. J.—The Martin Metals Corp. has leased part of a 4-story building at 115-117 Monroe street, which it will utilize for a new plant.

PERTH AMBOY, N. J.—The Safety Device Co. has been incorporated with $125,000 capital stock by William K. Bassford, Henry A. Rumler and Emil Stremiau.

RUTHERFORD, N. J.—The Kent Oil Burner Corp. has been incorporated with $100,000 capital stock by Thomas F. Kent, C. H. Griffith and William H. Mackye.

BROOKLYN, N. Y.—The Standard Boiler Corp. has increased its capital stock from $100,000 to $300,000.

BROOKLYN, N. Y.—The Made Rite Metal Products has been incorporated with $10,000 capital stock by L. H. Baier, M. Lipshutz and A. Wilson. The company is represented by R. K. Jacobs, 100 Broadway.

LONG ISLAND CITY, N. Y.—The Siemund Wenzel Electric Welding Co. has acquired a site for a new plant.

NEW YORK—The Manhattan Brass Co., 332 East Twenty-eighth street, plans extensions and improvements to its plant to cost about $25,000.

NEW YORK—The A. H. Wolfgas Radiator Co. has increased its capital stock from $50,000 to $200,000.

NEW YORK—A $190,000 garage will be erected at 289-291 South street, by Daniels & Kennedy.

NEW YORK—The Knickerbocker Portland Cement Co., 342 Madison avenue, plans a plant addition at Hudson, N. Y., to cost about $100,000.

NEW YORK—The Federal Adding Machines has been incorporated with $500,000 capital stock by J. L. Leithead, H. J. Kristeller and others. The company is represented by D. J. Wagner, 30 Church street.

NEW YORK—The Spridgeon Machine Co. has been incorporated with $50,000 capital stock by H. Stern, J. W. Spridgeon and S. Klotz. The company is represented by M. D. Kopple, 66 West Fortieth street.

NEW YORK—The Schwartz Iron Works has been incorporated with $10,000 capital stock by C. Schwartz, E. L. Blitz and H. Kerner. The company is represented by H. Rosenblum, 220 Broadway.

NEW YORK—The Air Registering Tire Valve Corp. has been incorporated with $20,000 capital stock by F. R. Shalitt, M. Bienenstock and J. Ellman. The company is represented by F. Harrison, 276 Fifth avenue.

ROME, N. Y.—The Rome Brass & Copper Co. plans a 1-story warehouse, 50 x 180 feet to cost about $50,000.

GREENSBORO, N. C.—The Carolina Steel & Iron Co. plans a building, 80 x 100 feet. J. W. McLennan is general manager.

HICKORY, N. C.—The Yeager Mfg. Co., which recently was formed with $125,000 capital stock, has awarded a contract for a 2-story plant building, 60 x 145 feet, to cost about $75,000.

STATESVILLE, N. C.—The C. H. Turner Foundry Co., Inc., has been incorporated with $100,000 capital stock by C. H. Turner, D. C. Ritchie and others, and has let a contract to the Maryland Metal Building Co. for a plant 70 x 135 feet, to cost about $17,000.

Industrial Business Changes Recently Announced

THE general sales management of the Pollak Steel Co., Cincinnati which heretofore has been directed from the New York office of the company, from now on will be conducted at the home offices. A New York sales office, however, will be continued in the Equitable building, under the supervision of Clyde Hicks, eastern representative.

* * *

Articles recently were filed by the Motor Industries Corp., Chicago, changing its name to the Motor Rim & Wheel Corp.

* * *

Henry T. Ripley, Inc., iron and steel construction contractor, has moved its office in Boston from 99 Chauncey street, to room 1206, 115 Chauncey street.

* * *

Announcement has been made to the effect the firm of Brenner Bros., Pawtucket, R. I., has been incorporated under the name of Brenner Bros., Inc. Jacob Brenner is president of the company.

* * *

The Phoenix Iron Works Co. is moving its New York sales office from 200 Fifth avenue to larger quarters at 55 Liberty street, New York. P. C. Rogers is eastern district sales manager.

* * *

The Motor Wheel Corp., Lansing, Mich., which recently took over the Disteel Wheel business of the Detroit Steel Co., also has absorbed the Forsyth Bros. Co., Harvey, Ill., manufacturer of steel wheels.

* * *

Offices have been opened in Detroit, at 415 East Jefferson avenue, by the Oilgear Co., Milwaukee. Donald Clute, formerly connected with the Cadillac Machinery Co., Detroit, is in charge of the new office.

* * *

Rawlins & Smith, with offices in the Atlas building, 604 Mission street, San Francisco, have been appointed Pacific Coast representatives for the Falcon Steel Co., Niles, O., and the Bliss & Laughlin Co., Harvey, Ill.

* * *

The Cleveland Metal Specialty Co. recently moved its plant and offices from West Sixth street and Long avenue, Cleveland, to 1783 E. Twenty-first street, that city, where it occupied nearly twice the space provided in their former quarters.

* * *

The Hayes Wheel Co., Jackson, Mich., has formally completed the purchase of the Imperial Wheel Co., Flint, Mich., and will conduct the plant of the acquired company under its old name for the present, as a unit of the Hayes organization.

* * *

W. E. Lamneck Co., Columbus, O., manufacturer of tools and supplies for sheet metalworkers, etc., has moved into a 4-story building formerly occupied by the Allen Motor Car Co. Offices will be located at 416-36 Dublin avenue, Columbus.

* * *

W. A. Taylor, Pacific Coast manager for the Wheeling Steel Products Co., Wheeling, W. Va., with offices in the Rialto building, San Francisco, has announced the opening of a branch office in the Washington building, Los Angeles. The new offices is in charge of W. M. Hall.

* * *

Purchase of the E. Mansfield Co., Orono, Me., manufacturer of tools, etc., by the Snow & Neally Co., Bangor, Me., manufacturer of saws, etc., recently was effected. William H. Luro, former owner of the Mansfield business, will continue in charge of the former E. Mansfield Co. under the new ownership.

* * *

Purchase of a 3-story building in Providence, R. I., by the Crane Co., Chicago and Bridgeport, Conn., has been effected. This structure will be used as a warehouse to care for the Rhode Island trade, which in the past has been served from the Boston warehouse. This will be the seventy-sixth branch warehouse operated by the company.

CAN THERE BE A BETTER METHOD OF LOADING?

IS it possible to load material mechanically on a principle superior to that built into the Link-Belt power-swiveling loader?

All of our experience—all of our engineering ability—all of our manufacturing skill—has been called upon to make this machine the "last word" in loader construction.

You must see this Link-Belt Loader at work to appreciate it. Briefly, here is how it operates—

Simply backs into the pile under its own power, cuts a complete semi-circle, digging and loading all the time. When the semi-circle is complete, it backs into the pile a little further, cuts another semi-circle (loading as fast as you can take care of the material) and repeats this operation until the job is done.

Simple, easy, effective—no "frills" or "attachments" to assist it—the principle is correct. It is built right—it works right. The entire Link-Belt organization stands behind it.

To be convinced, let us show you one of the Link-Belt Power Swiveling Loaders in operation.

LINK-BELT COMPANY

950

PHILADELPHIA

New York	Woolworth Bldg.
Boston 9	49 Federal St.
Pittsburgh	1501 Park Bldg.
St. Louis	Central National Bank Bldg.
Buffalo	547 Ellicott Square
Wilkes-Barre	2nd National Bank Bldg.
Huntington, W. Va.	Robson-Prichard Bldg.

CHICAGO

Cleveland	429 Kirby Bldg.
Detroit	4210 Woodward Ave.
Kansas City, Mo.	306 Elmhurst Bldg.
Seattle	820 First Ave., S.
Portland, Ore.	10 First St.
San Francisco	168 Second St.
Los Angeles	167 N. Los Angeles St.

INDIANAPOLIS

Denver	Lindrooth, Shubart & Co., Boston Bldg.
Louisville, Ky.	Frederick Weicle, Starks Bldg.
New Orleans	C. O. Hins 504 Carondelet Bldg.
New Orleans	Whitney Supply Co. Ltd. 418 S. Peters St.
Birmingham, Ala.	S. L. Morrow, 720 Brown-Marx Bldg.
In Canada,	Canadian Link-Belt Co., Ltd., Toronto & Montreal

H. W. CALDWELL & SON CO., CHICAGO, 17th and Western Ave., NEW YORK, Woolworth Bldg. DALLAS, TEXAS, 702 Main St

LINK-BELT

READING, PA.—The American Bosch Magneto Corp. has purchased the plant of the Reading Standard Motorcycle Co., which it will equip for its own use.

VERONA, PA.—The plant of the Pittsburgh Wire Rope Co. recently was damaged by fire.

ATHENS, TENN.—The Athens Plow Co. has been incorporated with $100,000 capital stock by R. J. Fisher, E. L. Willson and others. It plans to erect a plant.

CHATTANOOGA, TENN.—The Casey-Hedges Co. has started work on an addition to its plant to cost about $150,000.

MEMPHIS, TENN.—The Pidgeon-Thomas Iron Co., 94 Second street plans a 2-story building, 150 x 350 feet, to cost about $85,000.

LYNCHBURG, VA.—The Allen-Morrison Sign Co. has let the contract for a 1-story building, to be 60 x 208 feet.

LYNCHBURG, VA.—The Allison-Morrison Sign Co. plans a plant for the manufacture of signs to consist of two one-story buildings, 60 x 208 feet and 60 x 140 feet.

NEWPORT NEWS, VA.—The Old Point Foundry Co. has been organized by J. Albert Dean, W. J. Johnstone and George H. Rowe and has leased the plant formerly occupied by the Hampton Foundry. It is said the company is considering the erection of a new plant, but this is not definite.

CHARLESTON, W. VA.—The Universal Smokeless Boiler Co. has increased its capital stock from $50,000 to $150,000.

RAINELLE, W. VA.—The East Rainelle Light & Power Co. has been incorporated with $25,000 capital stock by D. D. Raine, J. W. Gray and J. G. Shewey.

EAU CLAIRE, WIS.—Cortes Ford, owner of the Paige-Jewett Motor Co., will build a $25,000 garage and repair shop, 72 x 93 feet, at North Farwell and Wisconsin ave-

Iron and Steel Prices

Iron Ore

LAKE SUPERIOR ORES
Per Gross Ton Lower Lake Ports

Old range Bessemer, 55 per cent iron	$5.95
Mesabi Bessemer, 55 per cent iron	5.70
Old Range nonbessemer, 51½ per cent iron	5.20
Mesabi nonbessemer, 51½ per cent iron	5.05

EASTERN LOCAL ORES
Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic, 53 to 63 per cent	9.50 to 10.50

FOREIGN IRON ORE
Cents per unit, c.i.f. Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	9.00 to 10.00
Algerian low phosphorus, 52 to 54 per cent	10.00 to 11.00
Swedish and Norwegian low phosphorus, 68 per cent	11.00 to 11.50
Swedish foundry or basic, 68 per cent	9.00 to 9.50
Spanish foundry or basic, 52 to 54 per cent	8.00 to 9.00

Manganese Ore

Brazilian, minimum 47 per cent, 33 cents, c.i.f. Atlantic ports.
Indian, 48 to 50 per cent, 33 cents c.i.f. Atlantic ports, 35 cents per uni.t
Caucasian, 53 to 55 per cent, nominal.

Fluor Spar

85 and 5% grade
Washed gravel, Kentucky and Illinois mines, per ton..... $21.50

Rivets

Structural rivets, Pittsburgh	3.00c
Boiler rivets, Pittsburgh	3.10c
Rivets, 7/8-inch and smaller	65 and 5 off

Nuts and Bolts

NUTS
(Up to 1¼ and 1⅜ inches inclusive)

Hot pressed square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched square or hexagon blank or tapped	$3.25 to $3.50 off list
Cold punched semifinished hexagon nuts ⅝-inch and larger	70-10-2½ off
Cold punched semifinished hexagon nuts 9/16-inch and smaller	70-10-5 off
Cast hardened, finished, hexagon	65-5 off

Price f.o.b. Pittsburgh, Packages of 50.

CARRIAGE BOLTS
¾ x 6 inches, smaller and shorter

Rolled thread	50-10-5 off
Cut thread	50 off
Larger and longer	50 off

MACHINE BOLTS
(⅜ x 4 inches, hot pressed nuts)

Rolled thread	60-5 off
Cut thread	50-10 off
Larger and longer	50-10 off

(⅜ x 4 inches, cold punched nuts)

Cut thread	45 off
Larger and longer	45 off
Lag screws	50-10 off
Ploy bolts Nos. 1, 2 and 3 heads	50-5 off
Tap bolts	30 off
Bolt ends with hot pressed nuts	50-10 off
Bolt ends with cold punched nuts	45 off
Blank bolts	50-10 off
Rough stud bolts with nuts	45 off

WASHERS

Wrought washers	$5.75 off list

Steel Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
Butt Weld		
⅛-inch	47	21½
¼ and ⅜-inch	53	27½
½-inch	58	44½
¾-inch	62	50½
1 to 3-inch	64	52½
Lap Weld		
2-inch	57	45½
2½ to 6-inch	61	49½
7 to 8-inch	58	45½
9 to 12-inch	57	44½
REAMED AND DRIFTED		
Butt Weld		
1 to 3-inch	62	50½
Lap Weld		
2-inch	55	43½
2½ to 6-inch	59	47½
EXTRA STRONG—PLAIN ENDS		
Butt Weld		
⅛-inch	43	26½
¼ and ⅜-inch	49	32½
½-inch	55	44½
¾-inch	60	49½
1 to 1½-inch	62	51½
2 to 3-inch	63	52½
Lap Weld		
2-inch	55	44½
2½ to 4-inch	59	48½
4½ to 6-inch	58	47½
7 to 8-inch	54	41½
9 to 12-inch	48	35½
DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	44	34½
¾ to 1½-inch	47	37½
2 to 2½-inch	49	39½
Lap Weld		
2-inch	43	34½
2½ to 4-inch	45	36½
4½ to 6-inch	44	35½
7 to 8-inch	40	27½

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers, carloads

	Black	Galvanized
THREADS AND COUPLINGS		
Butt Weld		
⅛ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13
Lap Weld		
1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
3 to 6-inch	28	13
7 to 12-inch	26	11
PLUGGED AND REAMED		
Two points less than above		
EXTRA STRONG, PLAIN ENDS		
Butt Weld		
⅛ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14
Lap Weld		
2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG		
Butt Weld		
½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39
Lap Weld		
2 and 2½-inch	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	..

Boiler Tubes

L. C. L. discounts. C. L. 4 points larger

STEEL	
1¾-inch	17½ off
2 and ¼-inch	20 off
2½ to 3-inch	40 off
3¼ to 4-inch	45 off
CHARCOAL IRON	
1½-inch	+16
1¾-inch	+ 6
2 and 2¼-inch	4
2½ to 3-inch	9
3¼ to 4½-inch	11
SEAMLESS COLD DRAWN	
1-inch	**51**
1¼ and 1½-inch	**43**
1¾-inch	**27**
2 and 2¼-inch	27
2½ and 2¾-inch	31
3-inch	35
3¼ to 4-inch	40
4½ and 5-inch	32
SEAMLESS HOT ROLLED	
3-inch	37
3¼ to 4-inch	42

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per net ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts

Carbon, 0.10 to 0.20 per cent	85 off
Carbon, 0.30 to 0.40 per cent	83 off
Carbon, 0.40 to 0.50 per cent	82 off

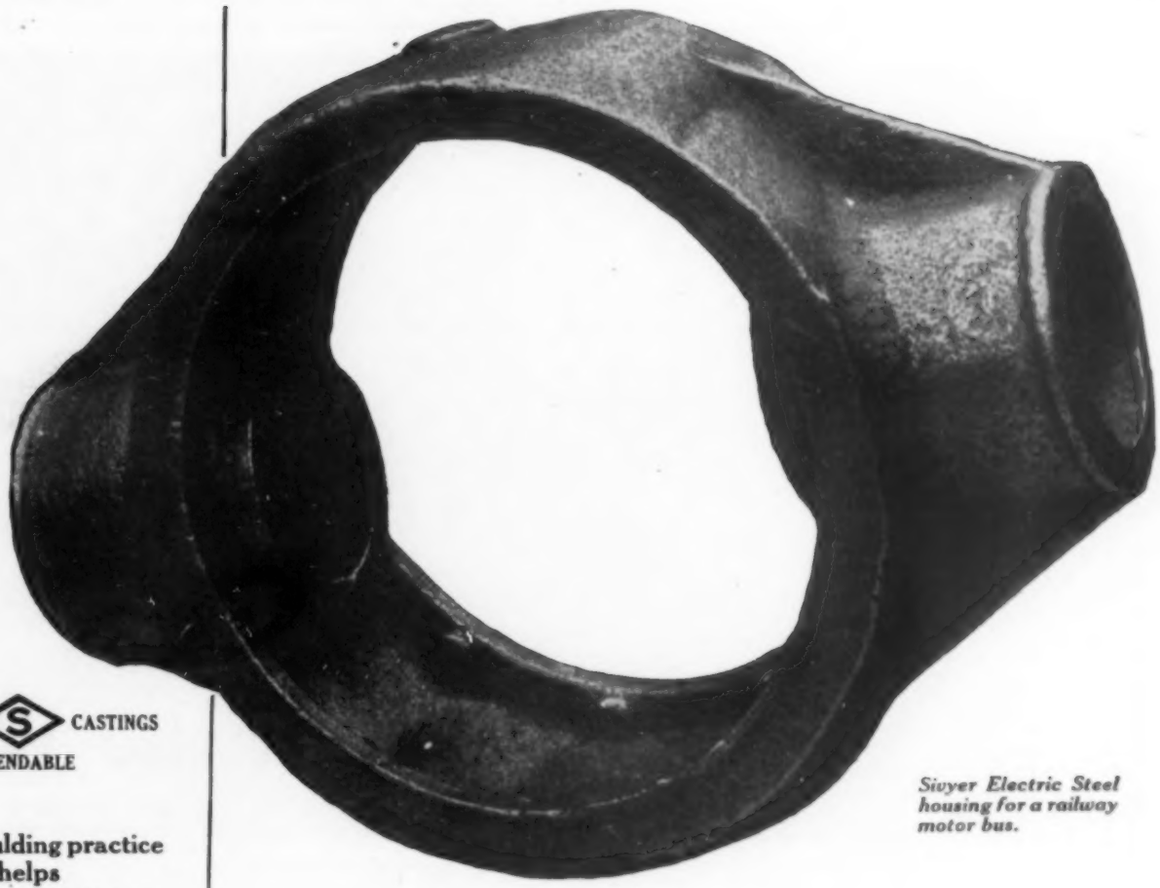
Plus usual differentials and extras for cutting.

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot, f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	19c
3-inch	7-gage	34c
1½-inch	9-gage	13¾c
5½-inch	9-gage	53c
5½-inch	9-gage	55c

Plus usual extras for forming and for long lengths.



Sivyer Electric Steel housing for a railway motor bus.

SIVYER (S) CASTINGS
DEPENDABLE

How moulding practice helps

Walls five sixteenths of inch thin in conjunction with bearings ralatively thick, and other features of design, make casting the most practical way of producing the housing shown above.

Open hearth practice does not permit the high temperature necessary for pouring sections that vary so much and so sharply.

In Sivyer Electric Steel, however, this housing is produced in the uniformly flawless form required by the service and machining demands. The superiority of the electric furnace is, of course, only partly responsible for the successful production of parts like these.

Sivyer moulding practice is even more important.

Before producing the casting shown here, it was necessary to produce a number of test castings by various moulding methods; these were sawed through at critical points, and tested in other ways, to make sure that no shrinks or strains occurred anywhere.

In this way the special moulding methods suggested by Sivyer experience and research were thoroughly tested until a practice was established that produced castings uniformly smooth and sound. The resulting production showed an exceptionally satisfactory machining cost, not a single casting being rejected.

Send blue prints

We are especially interested in making experimental castings for manufacturers. If you will send us your blue prints for troublesome parts, together with a statement of your difficulties, we will study the problems involved and recommend possible solution without obligation on your part.

Giving the engineer a greater freedom in design

THE restrictions imposed on automotive design by the limitations of ordinary methods of shaping iron and steel are often completely removed by using Sivyer Electric Steel. This unusually adaptable metal frees the engineer from the unsatisfactory compromises that forgings often compel. It spares him the machining troubles that open hearth steel is likely to cause when cast in intricate or otherwise difficult shapes. It places at his disposal a range of tensile strengths and elastic limits that are unusual even for steel, and, of course, utterly beyond the reach of iron.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

nues. Bids will be taken April 15.

KENOSHA, WIS.—Dr. J. L. Halpert will build a public garage and repairshop building on West Main street for the use of the Robbiski Garage Co. It will cost $20,000 and be 53 x 100 feet, 2-story.

LA CROSSE, WIS.—Vincent A. Roth and W. D. Fackler have formed the LaCrosse Pinless Clothes Line Mfg. Co. and opened a shop at 500 North Fourth street to manufacture a patented clothesline of galvanized steel wire.

MILWAUKEE—The Globe Sheet Metal Co. has been incorporated by Joseph Volpert, Isaac Glaser and Max Katz.

MILWAUKEE—The Mullins Body & Tank Co. has been incorporated with $100,000 capital stock by Clarence J. Mullins, and others.

MILWAUKEE—Fritzke & Icke Inc., has been incorporated with 500 shares of no par value to manufacture machinery, etc., by Paul C. Fritzke, Frank Icke and M. Fritzke.

MILWAUKEE—The Samisco Co. has been incorporated for $100,000 to build and lease machines making ice cream sandwiches. The incorporators are Arthur C. Leich, J. S. Becher and R. A. Bigaus.

MILWAUKEE—C. W. Valencourt, 173 Twelfth street, Milwaukee, will build a repair shop, 60 x 110 feet, part 2-story, at Sixteenth street and Fond du Lac avenue at a cost of $20,000 complete.

MILWAUKEE—The Henry Danischefsky Co., 1484 Humboldt avenue, has the contract to build a 2-story shop building, 41 x 121 feet, for a company which will manufacture springs. Paul O. Kopplin, 1145 Twelfth street, represents the owners.

MILWAUKEE—R. E. Stoelting, commissioner of public works, has been granted authority to make repairs and improvements in the municipal garage disposal plant to increase the capacity from 300 to 400 tons a day.

MILWAUKEE—The Milwaukee Pump & Supply Co. has been incorporated with $25,000 capital stock by Leo Pfau, well known inventor and designer of pumping equipment; George J. Walter and Julius O. Rochl, attorney, 425 East Water street.

MILWAUKEE—For the equipment of the Riverside pumping station now being built the city water department has purchased six 42-inch gate valves from the Kenedy Valve Mfg. Co. at $7900, and three 42-inch venturix type meters from the Simplex Valve & Meter Co. at $8195.

MILWAUKEE—The Globe Sheet Metal Co. has been incorporated with $12,000 capital to succeed to the partnership business known as the Globe Sheet Metal & Furnace Works at 567 Third street. The ownership is unchanged, consisting of Joseph Volpert and Max Katz. Isaac Glaser is a new stockholder.

RACINE, WIS.—Architect A. L. Flegel, Racine and Chicago, is preparing plans for a 3-story factory addition, 62 x 392 feet, for the Hamilton-Beach Mfg. Co. About $250,000 will be spent for building and machinery.

RACINE, WIS.—Plans for the proposed $500,000 Racine high school are being drawn by Architects Perkins, Fellows & Hamilton, 814 Tower court, Chicago, and will be ready for bidders about April 1. A. H. Schaefer is secretary of the school board.

RHINELANDER, WIS.—Architects Smith & Reynolds, Manitowoc, Wis., are preparing plans for a new $300,000 high school with manual training department for the city of Rhinelander. August Carlson is chairman of the building committee.

SAUK CITY, WIS.—A charter has been granted to the Green Premier Truck Co., with $24,000 capital, to build motor trucks, motor buses, etc. The incorporators are William G. and Charles H. Bongard and Henry T. Grass.

SHEBOYGAN, WIS.—The H. & B. Iron & Metal Co. has been organized by Gust Holman, Julius M. Balkansky and David Balkansky.

WAUPIN, WIS.—A general machine and repair shop has been built on the site of the old J. S. Morris Carriage Works, recently burned, by a group of former Morris employes, namely, Herman Erdman, Mike Derfahl and Joseph Hiller. It will be conducted as the Waupun General Repair Shop.

WISCONSIN RAPIDS, WIS.—The Blue Seal Iron Co. has been incorporated here for $30,000 by Otto Roenius, Oscar E. Uehling and Otto A. Labus, officials of the American Carbonic Machinery Co., which recently absorbed the Grand Rapids Foundry Co., which has been furnishing its casting supply.

Throughout the West

FRESNO, CAL.—The San Joaquin Light & Power Corp. plans a power house to cost about $105,000.

LOS ANGELES—The Standard Tool & Supply Co. has acquired a site on which it plans a plant.

OAKLAND, CAL.—The Walter Hardman & Co., Inc., have been incorporated with $10,000 capital stock to operate foundries, etc., by Robert F. Marcum, 527 Crofton street, and Walter and M. Hardman.

OAKLAND, CAL.—P. C. Bayard, Portland, Oreg., has awarded a contract for a 1-story plant here, to be devoted to the manufacture of gas furnaces. The building will cost about

(Concluded on Page 474)

New Trade Publications

DIE HEADS—The Eastern Machine Screw Corp., New Haven, Conn., has published a 94-page illustrated booklet in which self-opening die heads are described and illustrated.

FURNACE LINING—A 4-page illustrated folder has been published by the Quigley Furnace Specialties Co., Inc., New York, in which boiler furnace economies effected through the use of proper furnace linings is pointed out.

MOLDING MACHINES—The Osborn Mfg. Co., Inc., Cleveland, has published a 62-page illustrated booklet in which molding machines for jolting, rolling-over, flask-stripping, pattern drawing and squeezing are described and illustrated.

SAND CUTTING MACHINE—The American Foundry Equipment Co., New York, is circulating a 12-page illustrated booklet in which a power sand cutting machine is described and illustrated. Specifications and an outline of mechanical features are given.

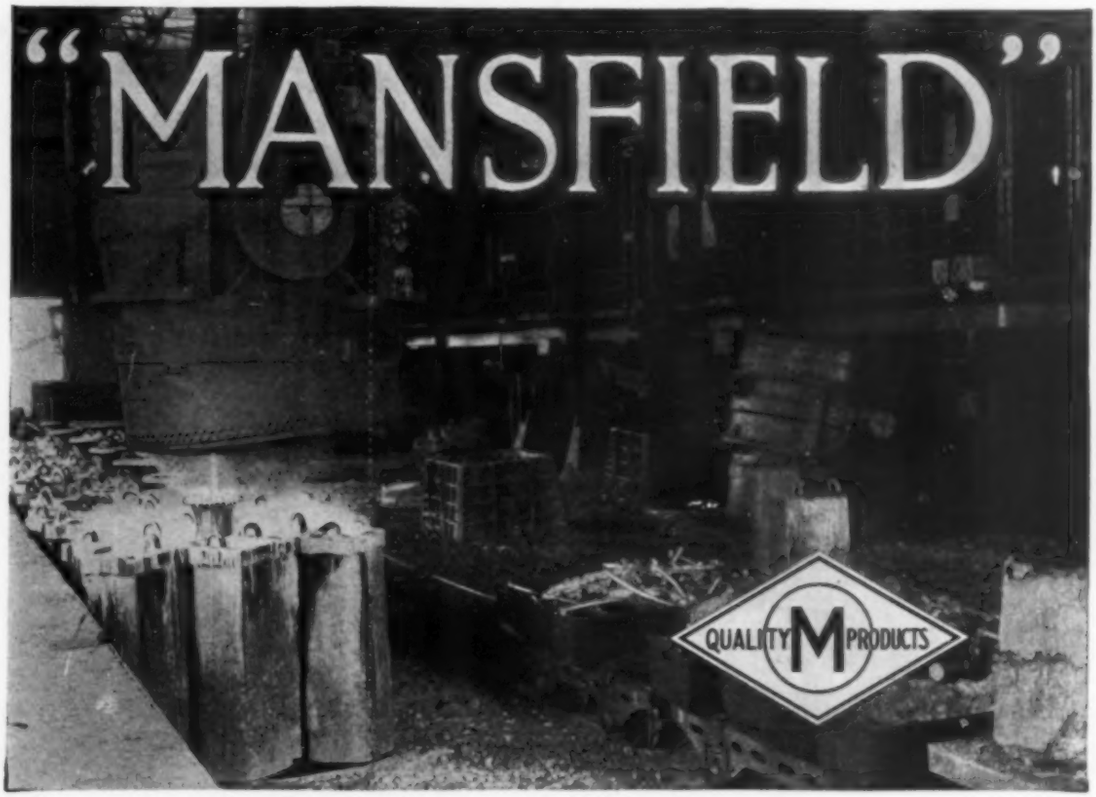
CUPOLA TAPPER—The Medart Co., St. Louis, has published a 4-page folder in which a safety cupola tapper and stopper is described and illustrated. According to the folder this device eliminates the use of the hinged spout and prevents accident in case one ladle does not follow another quickly enough to prevent the reservoir spout overflowing.

CUPOLAS—J. W. Paxson Co., Philadelphia, has published an illustrated folder in which cupolas are illustrated. One page of the folder contains an illustration of a bottom discharging crane ladle. Attention also is called to the company's other products which include sand blast, tumbling barrels, core ovens, brass furnaces, core machines, sand separators, dust collectors, magnetic separators, etc.

LADLES—A 32-page illustrated booklet has been published by the J. W. Paxson Co., Philadelphia, in which foundry ladles are described and illustrated. The bowls of these ladles are of heavy steel plates, designed for strength and stiffness, machine riveted to flanged steel heads. The bowls of ladles up to 400 pounds capacity have forged lips and have vent holes in the sides and bottom to carry off gases. Gearing is standard on all stock ladles and is of the improved worm and worm wheel type reduced through bevel gears to handwheel. Other details of construction and design are given.

MILLS—A 32-page illustrated booklet has been published by the Hardinge Co., New York, in which conical ball and pebble mills are described and illustrated and their application to the field of grinding and pulverizing pointed out. Both the ball and pebble mills are of similar construction, the only difference being that the ball mill in the larger sizes is designed to withstand heavier loads and has a different type of lining. Material ground in these mills include abrasives, aluminum dross, anthracite coal, asbestos rock, carbide, cement clinker, chalk, charcoal, chemicals, coke, ores, iron borings, pigments and numerous other materials.

PUMPS—Small single-stage centrifugal pumps for motor or belt drive are described and illustrated in a leaflet and in an instruction manual issued by the De Laval Steam Turbine Co., Trenton, N. J. These pumps are made in 1½ and 2-inch sizes and are designed for capacities ranging from 5 gallons per minute against 10-foot head up to 130 gallons per minute against a 150-foot head. They contain few and simple parts, according to the folders, and are manufactured to limit gages to insure interchangeability. The publications contain complete tables and instructions for selecting pumps for different conditions and explain how to determine the proper speeds and how to select piping, valves, fittings, and driving pulley or motor, to secure an efficient and satisfactory installation.



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Body Stock; Flat Fender and Hood Stock; Cowl Stock; Radiator Casing Stock; Crown Fender Stock.

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Mansfield Sheets are unusually low in sulphur

BLUED STOVE PIPE and ELBOW STOCK

MILK CAN STOCK

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Mr. Geo. W. House, 1822 Ford Building, Detroit, Mich.
The L. D. Rockwell Co., 1201 National Bank Building, Cleveland, Ohio.
The Maynard French Steel Co., 516 Mercantile Library Bldg., Cin., O.
Walter G. Clark, Inc., 106 N. Third St., St. Louis, Mo.
Walter G. Clark, Inc., 313 American Bank Bldg., Kansas City, Mo.
Mr. C. H. Beach, 617 Merchants Bank Bldg., Indianapolis, Ind.
Mr. A. P. Grenier, 640 Endicott Bldg., St. Paul, Minn.
Mr. Herbert P. Hill, 401 Continental Trust Bldg., Washington, D. C.
Wm. P. Horn Co., 237 Rialto Bldg., San Francisco, Cal.
Wm. P. Horn Co., 301 Kerchoff Bldg., Los Angeles, Cal.
Wm. P. Horn Co., Dekum Building, Portland, Ore.
Wm. P. Horn Co., 1426 L. C. Smith Bldg., Seattle, Wash.
Mr. Edwin Schofield, 45 Jarvis St., Toronto, Ont., Canada.

Iron and Steel Scrap Prices

CORRECTED TO TUESDAY NOON GROSS TONS DELIVERED TO CONSUMER

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	$16.00 to 18.00
Boston (dealers)	16.00 to 16.50
Chicago	19.00 to 19.50
Buffalo	21.00 to 21.50
Cleveland	20.50 to 20.75
Cincinnati	18.50 to 19.00
Detroit (dealers)	18.00 to 19.00
Eastern Pennsylvania	20.00 to 21.00
New York (dealers)	17.25 to 17.75
Pittsburgh	23.50 to 24.00
San Francisco	14.00
St. Louis	19.00 to 19.50
Valleys	22.75 to 23.00
No. 1 railroad steel New York (dealers)	18.25 to 18.75

BUNDLED SHEETS

Buffalo	$15.50 to 16.25
Cleveland	14.00 to 15.00
Cincinnati	14.50 to 15.00
Detroit	16.00 to 17.00
Eastern Pennsylvania	18.50 to 19.00
Pittsburgh	19.50 to 20.00
St. Louis	12.25 to 12.75
Valleys	17.50 to 18.50

STEEL RAILS, SHORT

Birmingham	21.00 to 22.00
Boston (dealers)	16.00 to 16.50
Chicago	23.25 to 23.75
Cincinnati	21.00 to 22.00
Cleveland	19.00 to 20.00
St. Louis	22.50 to 23.00

STOVE PLATE

Birmingham	18.00 to 19.00
Boston (consumers)	16.00 to 17.00
Buffalo	19.00 to 19.75
Chicago	20.00 to 20.50
Cincinnati (net)	14.50 to 15.00
Cleveland	18.00 to 18.50
Detroit (net ton) (dealers)	16.00 to 16.50
Eastern Pennsylvania	19.00 to 19.50
New York (dealers)	15.50 to 16.50
Pittsburgh	17.50 to 18.00
St. Louis	19.50 to 20.00

LOW PHOSPHORUS

Buffalo	$24.50 to 25.00
Cincinnati	19.00 to 19.50
Eastern Pennsylvania	25.00 to 26.00
Pitts. billet and bloom crops	26.50 to 27.50

SHOVELING STEEL

Chicago	18.50 to 19.00
Pittsburgh	19.00 to 19.50
St. Louis	18.00 to 18.50

KNUCKLES, COUPLERS & SPRINGS

Chicago	26.00 to 26.50
Eastern Pennsylvania	24.00 to 25.00
Pittsburgh	24.50 to 25.50
St. Louis	26.00 to 26.50

COMPRESSED SHEETS

Buffalo	$19.50 to 20.25
Chicago	16.50 to 17.00
Pittsburgh	21.50 to 22.00
Cleveland	18.50 to 19.00
Detroit (dealers)	15.00 to 15.50
Valleys	20.50 to 20.75

FROGS, SWITCHES, GUARDS

Chicago	19.00 to 19.50
Eastern Pennsylvania	20.00 to 21.00
St. Louis	20.00 to 20.50

BOILER PLATE, CUT

St. Louis (dealers)	$15.00 to 15.50

ANGLE BARS—STEEL

Chicago	21.50 to 22.00
St. Louis	19.00 to 19.50

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	$19.00 to 20.00
Boston (dealers)	17.00 to 17.50
Buffalo	19.50 to 20.00
Chicago, No. 1	20.25 to 20.75
Chicago, No. 2	19.00 to 19.50
Cincinnati No. 1	15.50 to 16.00
Cleveland, No. 1	12.00 to 12.25
Eastern Pennsylvania, No. 1	23.00 to 23.50
Pittsburgh No. 1	22.00 to 22.50
Pittsburgh, No. 2	22.50 to 23.00
New York, No. 1 (dealers)	19.00 to 20.00
St. Louis, No. 1	19.50 to 20.00
St. Louis, No. 2	19.00 to 19.50

WROUGHT PIPE

Boston (dealers)	13.00 to 13.50
Buffalo	17.50 to 18.00
Eastern Pennsylvania	18.50 to 19.50
New York (dealers)	16.00 to 16.50

YARD WROUGHT

Boston	$15.00 to 15.50
Eastern Pennsylvania	20.00 to 21.00

CITY WROUGHT

New York, long	$18.00 to 19.00

BUSHELING

Buffalo, No. 1	$19.50 to 20.25
Chicago, No. 1	18.00 to 18.50
Chicago, No. 2	12.75 to 13.25
Cincinnati No. 1	16.00 to 16.50
Cleveland, No. 1	17.00 to 17.25
Cleveland, No. 2	14.00 to 15.00
Detroit, No. 1	15.00 to 16.00
Detroit, No. 2 (new)	14.00 to 15.00
Detroit, No. 2 (old)	12.00 to 13.00
Eastern Pennsylvania, No. 1	17.50 to 18.00
Pittsburgh, No. 1	18.00 to 18.50
St. Louis, No. 1	17.00 to 17.50

MACHINE SHOP TURNINGS

Birmingham	$11.00 to 12.00
Boston (dealers)	12.50 to 13.00
Buffalo	15.75 to 16.25
Chicago	14.00 to 14.50
Cleveland	16.00 to 16.25
Cincinnati (net)	12.50 to 13.00
Detroit (dealers)	13.00 to 13.50
Eastern Pennsylvania	18.00 to 18.50
New York (dealers)	15.00 to 15.50
Pittsburgh	18.50 to 19.00
St. Louis	12.50 to 13.00
Valleys	16.00 to 17.00

CAST IRON BORINGS

Birmingham (Chemical)	16.00 to 16.50
Birmingham, borings (plain)	11.00 to 12.00
Boston (chemical)	17.00 to 18.00
Boston (dealers)	13.50 to 14.00
Buffalo	17.50 to 18.00
Chicago	15.75 to 16.25
Cincinnati (net)	13.00 to 13.50
Cleveland	17.50 to 18.00
Detroit (dealers)	14.50 to 15.00
Eastern Pennsylvania	17.50 to 18.50
Eastern Pennsylvania (chemical)	23.00 to 24.00
Pittsburgh	20.00 to 20.50
New York (dealers' price)	15.50 to 16.50
St. Louis	14.00 to 14.50
Valleys	17.75 to 18.00

MIXED BORINGS AND TURNINGS
(For blast furnace use)

Boston (dealers)	$12.50 to 13.00
Cleveland	17.00 to 17.25
Detroit (dealers)	14.00 to 14.50
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.50 to 15.00

IRON AXLES

Birmingham	23.00 to 25.00
Boston	27.00 to 28.00
Buffalo	24.00 to 25.00
Chicago	29.50 to 30.00
Cincinnati	26.00 to 27.00
Eastern Pennsylvania	28.00 to 30.00
New York (dealers)	29.00 to 30.00
Pittsburgh	34.00 to 35.00
St. Louis	31.00 to 31.50

IRON RAILS

Buffalo	$19.75 to 20.25
Chicago	23.50 to 24.00
Cincinnati	17.00 to 18.00
Cleveland	18.00 to 18.50
St. Louis	22.00 to 22.50

PIPES AND FLUES

Chicago	$14.50 to 15.00
Cincinnati	13.00 to 13.50
Cleveland	14.75 to 15.50
St. Louis	14.00 to 14.50

RAILROAD GRATE BARS

Buffalo	$19.00 to 19.50
Chicago	21.00 to 21.50
Cleveland	18.00 to 18.50
Eastern Pennsylvania	19.00 to 19.50
New York (dealers)	15.50 to 16.50
St. Louis	19.00 to 19.50

FORGE FLASHINGS

Boston (dealers)	13.50 to 14.00
Chicago, small	14.50 to 15.00
Cleveland	15.50 to 16.25
Cleveland, large	15.00 to 15.50
Detroit (dealers)	14.50 to 15.00

FORGE SCRAP

Boston	13.50 to 14.00
Chicago	19.00 to 19.50
Eastern Pennsylvania	18.50 to 19.00

ARCH BARS AND TRANSOMS

Chicago	26.50 to 27.00
St. Louis	26.00 to 26.50

ANGLE BARS—IRON

Chicago	$26.00 to 26.50
St. Louis	26.00 to 26.50

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	$14.00 to 14.50
Buffalo	$20.00 to $20.50
Chicago	17.00 to 17.50
Cleveland	17.00 to 17.25
Eastern Pennsylvania	19.00 to 20.00
Pittsburgh	21.00 to 21.50
St. Louis	15.00 to 15.50

STEEL CAR AXLES

Birmingham	$23.00 to 25.00
Boston (dealers)	23.00 to 24.00
Buffalo	23.00 to 24.00
Chicago	23.00 to 23.50
Cleveland	22.00 to 22.50
Eastern Pennsylvania	24.00 to 25.00
New York (dealers)	27.00 to 28.00
Pittsburgh	23.50 to 24.00
St. Louis	27.00 to 27.50

SHAFTING

Boston (dealers)	$23.00 to 24.00
Chicago	24.50 to 25.00
Eastern Pennsylvania	24.00 to 25.00
New York (dealers)	17.50 to 18.00
St. Louis	22.50 to 23.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, tram car	$22.00 to 24.00
Birmingham iron	21.00 to 23.00
Boston (consumers)	20.00 to 21.00
Buffalo, iron	22.00 to 22.75
Chicago, iron	26.00 to 26.50
Cincinnati	21.50 to 22.50
Eastern Pennsylvania, cupola	24.00 to 25.00
New York, iron (dealers)	21.50 to 22.00
Pittsburgh, iron	24.50 to 25.00
Pittsburgh, steel	24.50 to 25.50
St. Louis, iron	27.00 to 27.50

NO. 1 CAST SCRAP

Birmingham cupola	$22.00 to 24.00
Boston (consumers)	23.00 to 24.00
Buffalo	24.00 to 25.00
Chicago, supola	25.75 to 26.25
Cincinnati, No. 1, machinery, cupola (net)	22.50 to 23.00
Cleveland, cupola	21.00 to 22.00
Detroit (net ton) (dealers)	20.00 to 21.00
Eastern Pennsylvania, cupola	24.00 to 25.00
New York, cupola (dealers)	21.00 to 22.00
Pittsburgh, cupola	24.50 to 25.00
San Francisco	26.00 to 27.00
St. Louis, agricultural	22.50 to 23.00
St. Louis, railroad	22.50 to 23.00
Valleys	22.00 to 22.50

HEAVY CAST

Boston (consumers)	$19.50 to 20.00
Buffalo	21.00 to 21.50
Cleveland	16.50 to 17.00
Detroit, automobile (net ton)	24.00 to 25.00
Eastern Pennsylvania	21.50 to 22.50
New York (dealers)	19.00 to 20.00
Pittsburgh	22.50 to 23.00

MALLEABLE

Boston (railroad)	$21.50 to 22.00
Buffalo	23.00 to 23.50
Chicago, railroad	26.00 to 26.50
Chicago, agricultural	26.00 to 26.50
Cincinnati, agricultural	18.50 to 19.00
Cincinnati, railroad	20.00 to 21.00
Cleveland, agricultural	21.00 to 22.00
Cleveland, railroad, nominal	22.50 to 23.00
Detroit (dealers)	21.00 to 21.50
Eastern Pennsylvania, railroad	20.00 to 21.00
Pittsburgh, railroad	25.50 to 26.00
Pittsburgh, agricultural	17.50 to 18.00
St. Louis, agricultural	22.50 to 23.00
St. Louis, railroad	23.00 to 23.50

Miscellaneous Scrap

RAILS FOR ROLLING
5 feet and over

Birmingham	21.50 to 23.00
Boston (dealers)	16.50 to 17.00
Chicago	21.50 to 22.00
Cleveland	22.00 to 22.50
Eastern Pennsylvania	22.00 to 23.00
New York (dealers)	20.00 to 21.00
Pittsburgh district	24.50 to 25.00
St. Louis	21.50 to 22.00

LOCOMOTIVE TIRES

Chicago	22.25 to 22.75
St. Louis	20.50 to 21.00

LOW PHOSPHORUS PUNCHINGS

Chicago	22.00 to 22.50
Eastern Pennsylvania	22.00 to 24.00
Pittsburgh	27.00 to 27.50

LOGEMANN

Double Ram Hydraulic
Scrap-Metal Presses

STANDARD
In Hundreds of Mills, Yards and Plants

Hydraulic-compressed scrap always commands the best prices. It is more conveniently stored—more economically handled—there is less loss from corrosion—less heat is required for remelting.

Loose Scrap is worth almost nothing.
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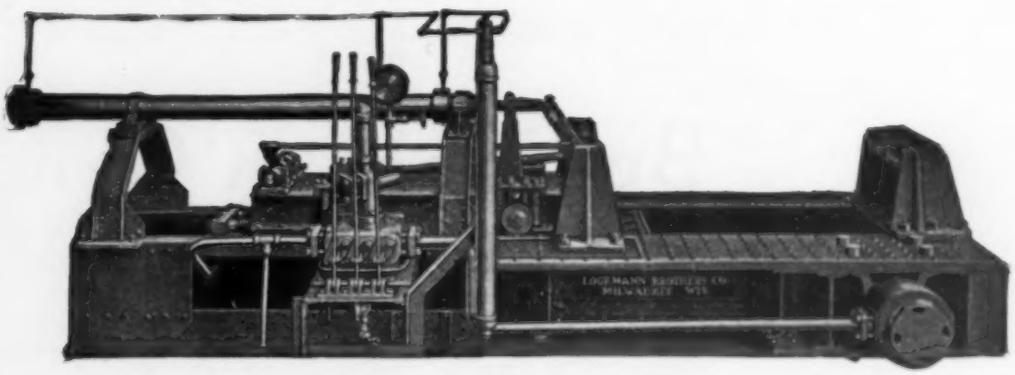

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Hand-balers for waste-paper, power and hydraulic balers for the textile trades, hydraulic presses for metal and waste trades.

Also Hydraulic Shaft Straighteners, Etc.

Composite Market Record

Monthly Averages of Fourteen Iron and Steel Products, 1913-1923, Compiled by Iron Trade Review

1923	
Average for Jan.	$41.17
Jan. 31	41.61
Jan. 24	41.41
Jan. 17	41.13
Jan. 10	41.05
Jan. 3	40.67
1922	
December	40.53
November	42.08
October	43.60
September	43.79
August	39.79
July	37.50
June	36.96
May	36.49
April	34.42
March	32.97
February	32.86
January	33.35
Average for year	37.86
1921	
December	33.99
November	34.71
October	35.46
September	35.34
August	35.99
July	38.14
June	41.87
May	43.32
April	43.84
March	45.37
February	$48.81
January	51.98
Average for year	40.74
1920	
December	54.04
November	63.75
October	68.61
September	69.28
August	68.93
July	68.29
June	67.89
May	68.26
April	67.49
March	65.47
February	65.63
January	59.40
Average for year	65.59
1919	
December	54.88
November	51.28
October	48.76
September	48.35
August	48.27
July	47.86
June	47.88
May	48.29
April	48.45
March	52.28
February	53.71
January	53.81
Average for year	$50.32
1918	
December	57.24
November	55.67
October	57.53
September	56.56
August	56.67
July	56.66
June	56.62
May	56.59
April	56.59
March	56.71
February	56.67
January	56.67
Average for year	56.68
1917	
December	56.68
November	58.29
October	67.75
September	83.18
August	89.69
July	89.56
June	82.66
May	73.96
April	66.48
March	61.07
February	56.76
January	55.10
Average for year	70.10
1916	
December	$53.68
November	46.77
October	41.50
September	39.97
August	39.67
July	38.37
June	39.63
May	39.78
April	39.13
March	37.18
February	35.63
January	33.66
Average for year	40.50
1915	
December	31.56
November	28.64
October	26.19
September	25.55
August	24.77
July	24.25
June	23.74
May	22.89
April	22.66
March	22.71
February	22.21
January	21.90
Average for year	24.76
1914	
December	$21.58
November	23.39
October	22.84
September	23.17
August	22.72
July	22.17
June	22.58
May	22.99
April	23.39
March	23.60
February	23.52
January	23.03
Average for year	22.92
1913	
December	23.29
November	24.02
October	24.91
September	25.55
August	25.97
July	26.34
June	26.78
May	27.34
April	27.74
March	27.93
February	28.05
January	27.96
Average for year	26.32

West of the Mississippi

(Concluded from Page 470)

$50,000, and will be leased by the McCorkle Mfg. Co., 319 Twelfth street, this city.

SAN BERNARDINO, CAL.—The Santa Fe railroad has a building program involving the expenditure of $800,000. It includes a boiler and paint shop, a turntable, a tin and pipe shop and other structures.

SAN FRANCISCO—F. Grimley, 317 Front street, has awarded a contract for a 2-story building, 50 x 155 feet, to be devoted to the manufacture of cans, etc.

SAN FRANCISCO—The Mark-Lally Co., jobbers, plans the erection of a warehouse and office building in Los Angeles, to be 80 x 175 feet.

WICHITA, KANS.—The Benjamin Sibbitt Iron & Foundry Co. has purchased land, 90 x 132 feet, which it will utilize as a storage yard.

MINNEAPOLIS—The Diamond Steel Products Co. has been incorporated with $150,000 capital stock by George G. Bouthinon, John T. McCarthy and John Pirie.

KANSAS CITY, MO.—The plant of the Twin City Tractor Co. recently was damaged by fire.

MARTHASVILLE, MO.—The Marthasville Electric Light & Power Co. has been incorporated by F. H. Suhre, H. W. Deubbert and E. H. Koch.

SPRINGFIELD, MO.—The Larimore Hydraulic transmission Co., 620 Landers building, has been incorporated with $1,000,000 capital stock by J. E. Cahill, J. W. Miller, H. T. Lincoln and J. E. Carpenter.

ST. LOUIS—The Producers Metal Products Co. has been incorporated with $30,000 capital stock by H. C. Schaper, W. J. O'Day and A. C. Schaper.

ST. LOUIS—The Wood Hydraulic Hoist & Body Co. has been incorporated with $10,552 capital stock by C. A. Wood, C. D. Lynch and S. D. Callender.

ST. LOUIS—The Dean Metal Co. has been incorporated with $20,000 capital stock by E. G. Dean, L. Meinecke Jr., and William Deubel to manufacture metal specialties.

ST. LOUIS—W. B. Burgess, 1320 Marcus avenue, has organized the W. B. Burgess Co. with $30,000 capital stock to manufacture wire goods, etc. It takes over an existing business. Incorporators are W. B. and N. A. Burgess.

ARDMORE, OKLA.—The Consumers Light & Power Co is reported planning a plant.

ARDMORE, OKLA.—The Brooks Burner Stove Co. plans a 1-story plant building, 90 x 100 feet.

BLOSSOM, TEX.—The plant and machinery of the Blossom Oil & Cotton Co. recently was damaged by fire.

FT. WORTH, TEX.—The General Foundry Co. has been incorporated with $7000 capital stock by B. N. Wadley, R. A. Stewart and F. M. Stewart.

PORT NECHES, TEX.—G. H. Roberts and R. F. Taylor have leased the shipyard owned by Swailes, Hance & Rowlins Construction Co.

SAN ANTONIO, TEX.—The Runkle Gear Shifter Co. has been incorporated with $10,000 capital stock by E. S. Chandler, J. E. Crabb and Clarence Hees.

SAN ANTONIO, TEX.—The Mission Machine & Supply Co. has been incorporated with $15,000 capital stock by F. C. Boeck, A. A. Jacobson and H. N. Bettison.

PORT ANGELES, WASH.—The Angeles Foundry Co. plans a foundry building, 50 x 90 feet.

TACOMA, WASH.—The General Foundry Co. has been incorporated with $40,000. The company is represented by Stiles & Laycham, 426 Tacoma building.

Business in Canada

LONDON, ONT.—The London Shipping Containers, Ltd., has purchased land and will build an addition to its plant, 45 x 370 feet.

MOUNT DENNIS, ONT.—The Electroplax Co., Toronto, Ont., manufacturers of electrical supplies, etc., will erect a manufacturing plant here. H. M. Hyland, Weston, is engineer and H. E. Cory is general manager.

OTTAWA, ONT.—The Plumbing Specialty Co., Ltd., has been incorporated with $30,000 capital stock by Walter J. Gilhooly, John B. Mulvey and Walter McM. Heney.

TORONTO, ONT.—H. B. Johnstone & Co., Dundas street, will rebuild a factory recently damaged by fire.

TORONTO, ONT.—The Howe Sound Pulp & Paper Co., Ltd., has been incorporated with $5000 capital stock by John A. Kent, G. M. Jarvis and G. S. O'Brian.

TORONTO, ONT.—Webster-Inglis, Ltd., has been incorporated to manufacture machinery, etc., with $100,000 capital stock by Arthur W. Holmestead, D. L. Ross and L. V. Sutton.

TORONTO, ONT.—Bids will be called Feb. 10, for an addition to the plant of Cutten & Foster, Church street, manufacturers of automobile tops, etc. W. F. Sparling & Co., University avenue, Toronto, are the architects.

LAUZON, QUE.—The plant of the Davie Shipbuilding Co. recently was damaged by fire.

QUEBEC, QUE.—The Quebec Development Co., organized to develop water power on the Grand Discharge and Lake St. John, North of Quebec City, is calling for bids on power plant equipment, also equipment for pulp and paper mills for Price Brothers. It is proposed to install 12 turbines, each with a capacity of 35,000 horsepower, during the next four years.